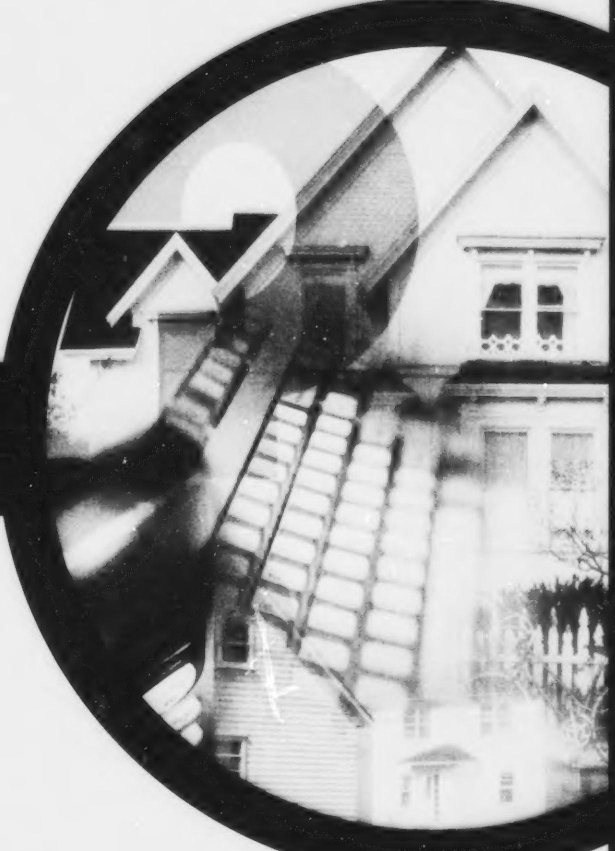
CANADA MORTGAGE AND HOUSING CORPORATION

Current Housing Research



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CURRENT HOUSING RESEARCH

Volume 5
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Issued also in French under the title: ***Recherches courantes sur l'habitation***

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CURRENT HOUSING RESEARCH ORDER FORM

If you wish to receive any of the completed reports or bibliographies listed, or if you would like to be on the mailing list to receive *Current Housing Research*, please fill out this form and send it to:

Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa ON K1A 0P7
Fax (613) 748-4069
Telephone 1-800-668-2642
Email: chic@cmhc-schl.gc.ca

Completed Reports Requested

Bibliographies Requested

☐ Send copies of above reports/bibliographies

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INTRODUCTION

Welcome to the first issue of "*Current Housing Research*". This publication merges *"Housing Research Quarterly"* and *"Current Housing Technology Initiatives"* and continues the numbering of the "Housing Research Quarterly".

Under Part IX of the National Housing Act the Government of Canada provides funds to Canada Mortgage and Housing Corporation to conduct research into the social, economic and technical aspects of housing and related fields.

Current Housing Research is compiled and produced three times a year by the Canadian Housing Information Centre. This publication provides information and access to research which is undertaken and sponsored by the Corporation. It is also available on CMHC's Website at chic@cmhc-schl.gc.ca

The publication contains information on completed research reports, new publications, videos and bibliographies, as well as planned and ongoing research projects. An alphabetical title index of items listed is included at the end for quick reference.

The overall arrangement of *"Current Housing Research"* is by broad subject category. Within each subject category, lists of planned and ongoing projects and completed research reports are described.

Each entry can contain the following elements:

- The project or report title;
- A description of the project or report results;
- The CMHC Project Officer who is managing the project;
- The Division within CMHC which is responsible for the project;
- For External Research Projects, the grant recipient undertaking the research;
- A Contract Identification Number (CIDN);

- The Status of the project: whether the project is in a planned, ongoing or completed phase. "Planned Projects" are those that are not yet underway, but are likely to be initiated in the current year. "Ongoing Projects" refer to research projects which are currently underway. No reports are yet available. Once the project is completed, and a report is available for distribution, it will be listed as a "completed report."

- Whether the report resulting from the research project is available and the address where the completed report can be obtained.

To discuss research projects that are recent or ongoing, please call CMHC General Inquiries at (613) 748-2000 and ask for the CMHC Project Officer identified under each project description.

CMHC's External Research Program

The objective of the CMHC External Research Program (ERP) is to encourage and enable researchers in the private and not-for-profit sectors to put forward and carry out relevant, innovative, and high quality housing research projects. Under the Program, financial contributions are made to support research investigations into important questions, problems, and issues affecting Canadian housing. Housing research priority areas are identified in the "External Research Program Grants for Housing Research Guidelines and Application Form".

Applicants to the External Research Program must be Canadian citizens or have permanent resident status in Canada.

Independent researchers as well as those employed in Canadian universities, institutions, private consulting firms, the professions and the housing industry may apply for these grants.

Full-time students at the graduate or undergraduate level are not eligible to apply. Students may be hired to assist in the conduct of the research, but under no circumstances may they take over responsibility for the direction of the work or the quality of the final report.

Individuals who are full-time federal, provincial or municipal government employees may apply. However, to be eligible, an applicant must provide a letter of support from her/his employer which shows that the proposed research is not part of, and will not interfere with, her/his regular work. CMHC employees are not eligible to receive grants under this Program.

CMHC is interested in receiving applications on topics related to its housing research priority areas. New ideas and innovative approaches in these areas are welcome.

To obtain the booklet outlining the priority research areas, the guidelines and application form for the External Research Program you may contact:

The Administrator
CMHC External Research Program
Research Division
Canada Mortgage and Housing Corporation
700 Montreal Road, Room C7-307
Ottawa, Ontario
K1A 0P7

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NOTE TO INTERNATIONAL CLIENTS

The *"Current Housing Research"* cites research reports and priced publications. **Availability and place of ordering varies with the type of report.**

PRICED PUBLICATIONS

Publications with prices listed in the *"Current Housing Research"* are available for sale to international clients. Prices are payable in Canadian dollars. Orders can be placed and the exact price, with shipping and handling, can be obtained from the following address:

CMHC Information Products
700 Montreal Road
Suite 1000
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2003
Fax: 613-748-2016

RESEARCH REPORTS

Research reports are listed without a price in the *"Current Housing Research"*. They are free to Canadian residents. However, to recover some of our distribution costs there is a fee to mail research reports to locations outside of Canada. The price for research reports mailed to destinations in the United States is $10.00 for each report. The price for research reports mailed to destinations in other countries is $15.00 for each report. Prices are payable in Canadian dollars. Research reports can be ordered from the address listed below:

Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367
Fax.: 613-748-4069
Internet: chic@cmhc-schl.gc.ca

TECHNICAL RESEARCH

ABORIGINAL HOUSING

FIRST NATIONS BUILDERS' TRAINING - DEVELOPMENT OF TRAINING MODULES.

In partnership with the Ontario First Nations Technical Services Corporation, the purpose of this project is to provide a set of new and revised technical training materials for First Nations builders training in Ontario. The three day curriculum will include a trainer manual and a participant handbook containing five revised CHBA/CMHC builders series booklets and four new booklets covering wood heat, frost protected slab-on-grade, frost protected shallow wood foundations, as well as the design and installation of two mechanical ventilation kits.

CMHC Project Officer: Tom Kerwin

CIDN: 1750 0300002

Division: Research Division

STATUS: Ongoing Project

ACOUSTICS

ACOUSTICAL PERFORMANCE OF THE PARTY WALLS, FLOOR-CEILING ASSEMBLIES AND EXTERIOR WALL OF THE CLOS ST-ANDRÉ PROJECT.

The objective of this project is to determine the acoustical performance of the party walls, floor-ceiling assemblies and exterior wall of the Clos St-André project.

CMHC Project Officer: Sandra Marshall

CIDN: 0840 0309008

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Hélène Beïque, Groupe Archi Plus inc.
480 St-Laurent Blvd., Suite 303
Montreal, Quebec H2Y 3Y7

AVAILABILITY: Publication not yet available

IMPACT ANALYSIS OF INDUSTRIAL NOISE ON SURROUNDING RESIDENTIAL SECTORS: A PICTURE OF THE SITUATION FOR THE BEAUCE AND QUEBEC AREAS.

The research project is aimed at describing the current situation regarding the impact of industrial noise, with the testing being performed in the Quebec and Beauce areas, two regions where there are many industrial parks adjacent to residential sectors.

CMHC Project Officer: Sandra Marshall

CIDN: 1845 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Jean-Gabriel Migneron, Université Laval
1636 Pavillon Félix-Antoine-Savard
Quebec, Quebec G1K 7P4

AVAILABILITY: Publication not yet available

ACOUSTICS

SOUNDPROOFING PROCURED BY THE EXTERIOR WALLS OF RESIDENTIAL PROJECTS.

The purpose of this project is to determine the acoustical performance of the exterior walls that are most commonly used in the construction industry.

CMHC Project Officer: Ken Ruest

CIDN: 2016 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Michel Morin, MJM Conseillers en Acoutique Inc.
6555 chemin Côte-des-Neiges Road, Suite 440
Montreal, Quebec H3S 2A6

AVAILABILITY: Publication not yet available

*NEW *

BASEMENTS, FOUNDATIONS & CRAWLSPACES

BASEMENT WALLS THAT DRY.

Research has shown that finished basement walls, with chronic wetting, produce molds dangerous to human health. This research suggests that no basement with a history of dampness should be finished until the moisture problems are completely remedied. This approach however ignores the reality that few people will spend the several thousand dollars to fix what they perceive to be inconsequential leaks. This project will attempt to find quick-drying basement wall systems, in hopes of being able to recommend these systems for marginal basements. A variety of basement insulation systems are being tested in University of Alberta test huts over the winter and spring of 1997-98. They have been subjected to a mid-wall leak and a 15 cm flood to measure the drainage and drying characteristics.

CMHC Project Officer: Don Fugler

CIDN: 1797 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

IMPROVED BASEMENT PERFORMANCE.

Concerns have been expressed by a number of authorities about the quality of construction of new basements. Technical and cost issues pertaining to the overall performance of poured-in-place concrete basements will be examined. The Canadian Standards Association (CSA), with CMHC and industry support, will improve the standard CAN3-A438-M84: Concrete Construction for Housing and Small Buildings. This standard addresses requirements for poured-in-place concrete basements. Several task groups are working to update this standard.

CMHC Project Officer: Don Fugler

CIDN: 1259 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

LATERAL BRACING OF FOUNDATION WALLS.

The purpose of this project is to assess the adequacy of current concrete foundation wall details to resist lateral pressures of various backfill heights, and to develop a booklet containing cost-effective details for typical situations where additional support is required. The details will be certified by a structural engineer registered in the province of Alberta. The project and development of the booklet will be managed by the Alberta Home Builders' Association on behalf of the Alberta Housing Industry Technical Committee (AHITC). AHITC is an alliance of major organizations (builder associations, Alberta New Home Warranty Program, Municipal Authorities and CMHC) which serves as the technical forum for the residential sector in Alberta.

CMHC Project Officer: Darrel Smith

CIDN: 2039 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

PERFORMANCE GUIDELINE DEVELOPMENT FOR BASEMENT SYSTEMS AND MATERIALS.

This multi-disciplinary, multi-agency study is identifying knowledge gaps in the performance of basement systems. Based on additional research, guidelines will be developed for design, construction and evaluation of basement materials and systems to ensure their durability and long-term performance. Test methods for evaluating the long-term performance of plastic foams and mineral fiber exterior basement wall insulations are being developed. These materials will then be monitored for field performance in demonstration projects. A guide to basement performance is also being drafted.

CMHC Project Officer: Don Fugler

CIDN: 1421 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PROPER CONSTRUCTION OF CRAWL SPACES FOR BUILDERS AND RENOVATORS.

CMHC's research and the 1995 National Building Code differentiate between crawl spaces that are inside or outside the building envelope. This short guide to crawl space construction is meant to be suitable both for Canadian houses and for houses in other countries. It illustrates the basic moisture movement principles in crawl spaces and how best to avoid moisture problems.

CMHC Project Officer: Don Fugler

CIDN: 1932 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

BASEMENTS, FOUNDATIONS & CRAWLSPACES

SLIDE PRESENTATIONS ON TWO FOUNDATION TYPES AND TO MONITOR THE PERFORMANCE OF THE EXAMPLES OF THE TWO FOUNDATION SYSTEMS.

The purpose of this project is to undertake and complete the development of two slide presentations and the monitoring of two foundations over a one-year period.

CMHC Project Officer: Tom Kerwin

CIDN: 1813 030000

Division: Research Division

STATUS: Ongoing Project

BUILDING CODES

REVISION TO "HOUSING AND BUILDING CODES: ISSUES FOR CONSIDERATION".

The objective of this project is to revise the May 1996 discussion paper "Housing and Building Codes: Issues for Consideration" which was prepared for the Federal/Provincial/Territorial Subcommittee on Housing and Building Codes.

CMHC Project Officer: Terry Robinson

CIDN: 1968 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

BUILDING MATERIALS

ADJUST-A-FORM.

The objective of this project is to develop ideas for adjustable, reusable forms. Specifically the project includes the inception to the development of a specific product ready for marketing. The end result will be a product that saves builders time and material and therefore project costs.

CMHC Project Officer: Darrel Smith

CIDN: 1501 0200001

Division: Research Division, Housing Technology Incentives Program

STATUS: Ongoing Project

Grant Recipient: Raymax Construction Limited
1038 Lesperance Road
Tecumseh, Ontario, N8N 1W8

AVAILABILITY: Publication not yet available

FEASIBILITY STUDY OF TOOLS DESIGNED SPECIFICALLY FOR THE REUSED BUILDING MATERIALS INDUSTRY.

The sizable contribution made by construction and renovation activity to the waste streams of Canadian municipal dump sites is an environmental concern. The recently formed, Used Building Materials Association (UBMA), was assembled to respond to the increased activity in the "de-construction" of buildings and the resale of used building materials. This project, undertaken with the UBMA, will identify current volumes of material and methods of removal, the historic use of fasteners, the reuse of used materials in the house of the future, and most importantly, identify tools which would speed and improve salvage methods.

CMHC Project Officer: Cate Soroczan
CIDN: 1892 0200001

Division: Research Division
STATUS: Ongoing Project

AVAILABILITY: Publication not yet available
NEW

INFORMATION ON DURABILITY AND SERVICE LIFE OF BUILDING ELEMENTS AND EQUIPMENT.

A Delphi project will be undertaken to collect information from property managers, property management firms and experts in differing fields such as ventilation systems, elevators, walls, parking garages, etc., to determine, from their experience, the service life of these elements. The Ontario Rent Control may use the results as a starting point on life expectancy information. The study may also provide data on building elements which in some cases would have low or high durability variances. Follow-up research could then be undertaken to investigate why those building elements have these high variances.

CMHC Project Officer: Ken Ruest
CIDN: 1915 0200001

Division: Research Division
STATUS: Ongoing Project

AVAILABILITY: Publication not yet available
NEW

MATERIALS FOR INCREASING THE VOLUME OF USED BUILDING MATERIALS IN CANADIAN CONSTRUCTION.

The purpose of this project is to prepare a paper outlining issues surrounding increasing the volume of used building materials in Canadian construction.

CMHC Project Officer: Peter Russell
CIDN: 1892 0200001

Division: Research Division
STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BUILDING MATERIALS

PERFORMANCE OF BOX BEAMS.

The objective of this project is to review the design specifications, production, assembly, and testing/monitoring criteria for box beams, and finalize the design and details of production and testing and monitoring protocol.

CMHC Project Officer: Glynis Kossatz

CIDN: 1176 0200001,
1348 0200001

Division: Research Division, Housing Technology Incentives Program

STATUS: Ongoing Project

Grant Recipient: Art Wloski
4133 Northcliffe Avenue
Montreal, Quebec, H4X 3L2

AVAILABILITY: Publication not yet available

VIRTUAL SAMPLE ROOM WEB SITE OF GREEN BUILDING MATERIALS.

The objective is to develop a web site which will serve as an on-line catalogue/sample room of building materials that provide low environmental impacts. It will serve anyone who is involved in the selection of the various building materials that go into residential buildings such as architects, builders, renovators, property managers, and homeowners. The intent of the site is to make available the information and knowledge currently available this topic. The site will contain pictures of the products, the evaluation matrix, and the manufacturers information. This is a multi-partnered project including Public Works and Government Services Canada, Department of National Defense, Natural Resources Canada, Rural Municipality of Waterloo, and Human Resources Development

CMHC Project Officer: Darrel Smith

CIDN: 1986 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

CONCRETE

ANTI-CARBONATION COATINGS FOR USE ON CANADIAN BUILDINGS.

Carbonation is a process that reduces the natural alkalinity of concrete. Cement hydrates in the concrete react with carbon dioxide, from the atmosphere, to produce calcium carbonates. Advanced carbonation can induce corrosion of the reinforcing steel in a reinforced concrete structure which can in turn lead to fracture formation in concrete and structural distress.

Coatings and sealers have been found to slow or prevent the progress of carbonation in European laboratory tests. This field study initiated testing of certain coatings/sealers to determine their effect on the rate of carbonation. The products to be tested were selected on the basis of technical data made available by the suppliers. The criteria for suitable products were carbon dioxide resistance, water vapour permeance, and water resistance.

Five years after the application of the anti-carbonation coatings, the depth of carbonation increased by about 5.5mm in the control areas that were not provided with any form of protection. The depth of carbonation in each coated area progressed by an average of about 3.5mm, with the exception of one coating which provided no apparent protection against carbonation.

The results indicate that none of the coatings evaluated in this study were able to totally arrest the progression of carbonation. Three out of the four tested coatings partially retarded the rate of carbonation. One of the coatings did not have any measurable effect on the carbonation rate. The most effective coating, a siloxane primer with a methacrylate topcoat, reduced the carbonation rate by approximately 50%.

Prepared by Halsall Associates Limited. Principal Consultant: Peter Halsall. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: Cate Soroczan. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE : Aussi disponible en français sous le titre : *Revêtements anti-carbonatation appliqués aux bâtiments canadiens.*

DEVELOPMENT OF A NEW EDITION OF THE STANDARD FOR CONCRETE CONSTRUCTION FOR HOUSING AND SMALL BUILDINGS (CSA A438).

The purpose of this project is to carry out the development of a new edition of the standard for concrete construction for housing and small buildings (CSA A438).

CMHC Project Officer: Jim Robar

CIDN: 1259 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CONCRETE

DURABILITY AND REPAIR OF CONCRETE - A PUBLICATION FOR BUILDING OWNERS AND MANAGERS.

This publication will examine repair strategies and provide repair-cost data and analytical tools for building owners and managers. It will be based on material presented at CMHC's seminars on cost-effective concrete restoration.

CMHC Project Officer: Cate Soroczan

CIDN: 1512 0200001-5

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

ELECTRO-CHEMICAL COMPATIBILITY OF STRUCTURAL PATCHES AND CONCRETE MIXES.

CMHC is supporting NRC/IRC research which will test an experimental patching mix and compare the results with commercial patching materials. The studies will attempt to determine the mix's compatibility with typical base concrete and its durability. A report is expected to be available late in 1998.

CMHC Project Officer: Cate Soroczan

CIDN: 1366 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

INVESTIGATION AND REPAIR STRATEGIES FOR CONCRETE CONSTRUCTION AND CATALOGUE OF INNOVATIVE CONCRETE ASSESSMENT AND REPAIR TECHNOLOGIES.

The purpose of this project is to create a survey questionnaire on concrete assessment, repair and monitoring strategies and report on existing protocols regarding concrete problems in multi-unit residential buildings.

CMHC Project Officer: Cate Soroczan

CIDN: 1865 0300001

Division: Research Division

STATUS: Ongoing Progject

AVAILABILITY: Publication not yet available

PRODUCTION AND ASSESSMENT OF QUALITY CONCRETE SURFACES.

This initiative will identify materials, methods, and evaluative tests to reduce the permeability of a concrete surface to gas and liquid. The objective is to produce a quality concrete surface ("covercrete") which would provide longer-term durability for residential concrete applications than is currently available. The work will be jointly funded by CMHC and NRC/IRC. The draft report is currently in the review stage.

CMHC Project Officer: Cate Soroczan

CIDN: 1517 0200001

Division: Research Division

STATUS: Ongoing Progject

AVAILABILITY: Publication not yet available

*** NEW ***

CONCRETE

STANDARDIZATION OF CONCRETE REPAIR PROTOCOLS.

This project will research current assessment, monitoring and repair strategies for concrete repair. Existing protocols commonly used in the field as well as existing protocol guidelines assembled by various agencies (eg. CSA) will be catalogued. This research will provide consultants, contractors and building owners with available protocols and concrete repair strategies.

CMHC Project Officer: Cate Soroczan

CIDN: 1890 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

CONTAMINATED LANDS

DEMONSTRATION OF SAFE HOUSING ON LIGHTLY CONTAMINATED LANDS.

CMHC research into contaminated lands shows that some types of soil contaminants could be rendered innocuous through building design and operation. One example is heavy metals deep within the soil. If these pollutants can be avoided through design, the cost of land remediation could be greatly reduced. The project will include contaminant monitoring and the investigation of the predictive capabilities of site specific risk assessments.

CMHC Project Officer: Don Fugler

CIDN: 1946 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

RISK ASSESSMENT PROCEDURES FOR HOUSING ON CONTAMINATED LANDS.

Two projects researched methods of performing risk assessments for houses on or near contaminated lands. The first project compared the risk assessment procedures currently in use by nine contractors and the risk assessments generated by the contractors when they are all presented with the same hypothetical case. The risk assessment was a screening level, as opposed to a detailed assessment. The variation in risk assessments from one firm to another was several orders of magnitude. The report reveals the causes of these significant variations. There is a main report and a shorter summary report available from CMHC.

The second project assembled housing factors that can be useful in calculating these risks and presents them in a manner that is easy for site assessors to use. Copies of this guide, Estimating the Concentrations of Soil Gas Pollutants in Housing, are also available from CMHC.

CMHC Project Officer: Don Fugler

CIDN: 1534 0200002

Division: Research Division

STATUS: Completed Report

CRIME PREVENTION

ROLE OF PUBLIC HOUSING INTERVENTIONS IN SAFETY IMPROVEMENT AND CRIME PREVENTION AT THE DISTRICT LEVEL IN MONTRÉAL

The objective of this contract is to produce a summary report of the research project for dissemination purposes.

CMHC Project Officer: Brendra Baxter

CIDN: 1411 0100002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

SAFE COMMUNITIES: INFORMATION PRODUCTS AND TRAINING MATERIALS.

In partnership with the RCMP, CMHC is developing materials to promote the principles of crime prevention through environmental design (CPTED). Priorities were identified at a stakeholder forum held in the spring of '97. Materials include case studies of success stories at the subdivision and community level, and the enhancement and adaptation of training materials for a variety of distinct audiences, including builders and developers. The advisory document is expectd to be available in the fall of 1998.

CMHC Project Officer: Paula Archer

CIDN: 1938 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

DOORS AND WINDOWS

DESIGN OF DURABLE JOINTS BETWEEN THE WINDOWS AND THE ENVELOPE.

The objective of this project is to establish construction, parameter and calculation method concepts to improve the durability of joints between walls and windows.

CMHC Project Officer: Jacques Rousseau

CIDN: 1839 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient : Mario Petrone, Petrone Architecte
200-2545 Delorimier Street
Longueil, Québec J4K 3P7

AVAILABILITY: Publication not yet available

DOORS AND WINDOWS

RETROFIT AND REMEDIAL WORK ON EXISTING SLIDING DOORS AND WINDOWS.

The proposed research project aims at the development of practical solutions to the problems associated with the typically reduced performance of existing sliding windows and doors in terms of weather tightness, due primarily to wearing of materials.

CMHC Project Officer: Oliver Drerup **CIDN:** 1834 0200001

Division: Research Division, External Research Program **STATUS:** Ongoing Project

Grant Recipient: Mr. Jozef Zorko, Associate Architect, Desnoyers Mercure Inc.
3601 University
Montreal, Quebec, H3A 2B3

AVAILABILITY: Publication not yet available

ENERGY CONSERVATION

BUILDING ENERGY ESTIMATION METHOD BASED ON FUZZY LOGIC AND NEURON NETWORKS.

The objective of this project is to establish a rapid building energy estimation method based on fuzzy logic and neuron networks.

CMHC Project Officer: Sandra Marshall **CIDN:** 1841 0200001

Division: Research Division, External Research Program **STATUS:** Ongoing Project

Grant Recipient: Stanislaw Kajl, Université du Québec,
INRS - Urbanisation in Montréal
3465 Durocher Street
Montreal, Quebec H2X 2C6

AVAILABILITY: Publication not yet available

CMHC EMPTIED HEAT, AIR AND MOISTURE TRANSPORT MODELLING PROGRAM.

To provide engineering services to upgrade the CMHC EMPTIED Program from a DOS to Windows environment and to compile the necessary weather data to allow the program to evaluate the performance of wall systems in major cities of the U.S.

CMHC Project Officer: Duncan Hill **CIDN:** 1107 0300003

Division: Research Division **STATUS:** Ongoing Project

ENERGY CONSERVATION

ENERGY EFFICIENCY CASE STUDIES OF MULTI-UNIT RESIDENTIAL BUILDINGS.

CMHC is in the process of documenting the application of energy efficiency measures in multi-unit residential buildings to be used as case studies. A trial case study of a housing co-operative in Ottawa is underway, to not only assess the strengths and weaknesses of the energy efficiency measures implemented, but also to identify what information can be disseminated to others in the building industry. Upon completion of the first case study, CMHC will be soliciting the housing industry for additional energy efficiency case studies. A compendium of case studies will be made available from CMHC. The case studies will also support the Energy Efficiency Opportunities Manual for Multi-Unit Residential Buildings that CMHC is in the process of developing.

CMHC Project Officer: Duncan Hill

CIDN: 1899 0200002,
1899 0200003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ENERGY EFFICIENCY OPPORTUNITIES MANUAL FOR MULTI-UNIT RESIDENTIAL BUILDINGS.

CMHC, in partnership with the Ontario Ministry of Municipal Affairs and Housing, is in the process of developing a manual that details energy efficiency measures for existing multi-unit residential buildings. The document will be based on one originally developed by the Ontario Ministry of Housing in the early 1980's. The new manual will offer proven, current energy efficiency measures for the building envelope, mechanical, electrical, and domestic hot water heating systems. A project steering committee consisting of members of the housing, utilities and government agencies has been formed to provide comment on the manual as it is developed. Publication of the manual is expected in 1998. The manual will be modularized and provided in such a format that will be easily updated over time.

CMHC Project Officer: Duncan Hill

CIDN: 1887 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ENERGY PERFORMANCE CONTRACTING IN MULTI-UNIT RESIDENTIAL BUILDINGS: FINAL REPORT.

Energy Performance Contracting, EPC, is a unique business arrangement under which an Energy Service Company, ESCO, provides a turnkey service to finance building renewal projects from utility and operating cost savings. The ESCO provides energy analysis, engineering, construction, financing, operator training and building maintenance services to design and implement energy efficiency projects in existing building facilities. In Canada, ESCOs have completed approximately $1 billion of projects since the early 1980's. The majority of projects have been in the institutional markets where energy use is relatively high, building ownership is stable, and third party lenders enjoy low credit risk customers.

A federal government sponsored survey of the EPC industry for 1994 reveals that of the approximately $200 million of projects initiated in that year, rental apartments and condominiums accounted for only 2.4% or $4.8 million of project value. This substantiates the general observation that EPC has yet to be fully exploited in the multi-unit residential sector.

The purpose of this project is to validate the effectiveness of EPC in the multi-unit residential sector. Five areas have been addressed: case studies of actual projects; best practices for procurement through to project financing; the U.S. experience; a review of current legislation; and policy and program recommendations. Twenty case studies of the application of EPC or EPC related projects have been documented. They indicate a growing interest by certain ESCOs in this relatively untapped market, describe the scope of measures typically implemented, financial arrangements entered into and the magnitude of the cost savings that have been achieved. Best practices and guidelines have been developed for building owners and operators for procurement, selection of energy efficiency measures, training, documentation, project financing, maintenance and utility analyses and monitoring. Sample procurement and contractual documents have been provided.

Prepared by Alan W. Levy Consulting. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Wayne Webster. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

FIELD INVESTIGATION OF ENERGY IMPACT OF CORRIDOR AIR VENTILATION SYSTEMS.

A research project has been initiated to study the seasonal impact of the operation of corridor air ventilation systems in multi-unit residential buildings on heating season energy consumption. Traditionally, it was assumed that corridor air systems should be shut down during periods of low occupancy and/or occupant activity in order to reduce energy consumption. However, it is also suspected that shutting off a natural gas-fired corridor air system in an electrically heated building, may actually increase energy consumption. Both of the aforementioned assumptions are based on the theory that corridor air systems are capable of effective and efficient air delivery - which is now known to be incorrect. The research will attempt to determine the influence that the operation of corridor air systems within 4 buildings has on energy consumption. The systems will be cycled on and off over a sufficient period to allow for an analysis of trends in resultant energy consumption. This study will help to characterize the costs of operating corridor air systems and will also serve to identify energy efficiency strategies.

CMHC Project Officer: Duncan Hill

Division: Research Division

AVAILABILITY: Publication not yet available

CIDN: 1934 0200002

STATUS: Ongoing Project

*** NEW ***

INTERNATIONAL ENERGY AGENCY (IEA) : ENERGY RELATED ENVIRONMENTAL IMPACT OF BUILDINGS.

This three-year project, scheduled to end in 1999, is an IEA activity in which 14 countries are collaborating in the development of life-cycle energy modeling. Information will be compiled and published on the methodology and life-cycle environmental impact data. Chapters will describe the theory and practice of the topic and will include examples of how methods may be applied to different building types; the terminology of life-cycle-analysis (LCA) as appropriate for buildings; a summary of the leading LCA methods and sources of expertise; and the potential for extending the influence of the task directly into academia. CMHC is acting as the Operating Agency for this project.

CMHC Project Officer: Peter Russell

CIDN: 1629 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

LABORATORY TESTING OF DENSE PACK CELLULOSE FOR ATTIC INSULATION.

Some insulators claim that dense packing of cellulose insulation into hard to reach cavities (e.g. flat roof attics) prevents air movement along with providing insulation. Hydro Québec is looking at the technique for upgrading attic insulation of flat roof housing, largely in Montreal. CMHC and the Société d'habitation du Québec (SHQ) are also contributing funds to this project. The laboratory work took place in a two-storey environmental chamber at Concordia University. A flat roof attic was constructed in the chamber, set-up for monitoring, insulated with the dense pack cellulose method, and cycled through a seasonal change. The laboratory work is complete and data analysis is in progress. The research team hopes to discover whether dense pack cellulose can:

- prevent moisture migration into attics,
- act as an air movement barrier, and
- retain its insulating properties when exposed to moist conditions.

CMHC Project Officer: Don Fugler

CIDN: 1377 02010001,
1377 08010001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

OPTIMIZE: A METHOD FOR ESTIMATING THE LIFECYCLE ENERGY AND ENVIRONMENTAL IMPACT OF A HOUSE.

This computer program estimates the lifecycle energy requirements of a house as well as determining associated emissions. The program has been revised from a spreadsheet to a database to improve the instructions and user interface, and the computational speed. Before release in August 1998, plans are to stretch the application of the program to include multiple, non part 9 building code residential buildings by using Optimize on the Conservation Co-op building in Ottawa. This exercise will also support the Green Building Challenge '98 and International Energy Agency (IEA) Annex 31 initiatives.

CMHC Project Officer: Peter Russell

CIDN: 0865 0201002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

A PHYSICAL CONDITION AND IAQ CHECKLIST FOR NRCAN'S ENERGUIDE FOR HOUSES RATING SYSTEM.

Natural Resources Canada (NRCan) and a number of industry stakeholders are in the process of developing a Canadian home energy efficiency rating system. The rating will be based on a visual evaluation of the house condition, a blower door test and energy data collection which will be analyzed using a computerized tool to identify the energy utilization of a new and/or existing home. The house will then be plotted on an energy utilization scale as it compares with performance criteria and assigned a numerical rating. The overall goal of this system is to reduce CO2 emissions on the environment. This CMHC project involves the production of an evaluation "checklist" that will be used to assess the physical condition and indoor environment of a house. This checklist will be available in June 1998.

CMHC Project Officer: Terry Marshall/Terry Robinson

CIDN: 1922 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RE-INSULATING WITHOUT ANY CONDENSATION PROBLEMS - EFFECT OF ADDING INSULATION ON THE DISPERSAL OF EXFILTRATING AIR.

The objectives of this project are: 1. To test a method of characterizing air exfiltration, experimentally and analytically. 2. To determine the impact of two insulation strategies - from inside and from outside - on the dispersal of exfiltrating air through various types of joints.

CMHC Project Officer: Sandra Marshall

CIDN: 1853 200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Dominique Derome, Concordia University
1455 de Maisonneuve Blvd. West
Montreal, Quebec H3G 1M8

AVAILABILITY: Publication not yet available

RENTAL STOCK ENVELOPE SURVEY.

The STAR Database, used for modeling Canadian housing performance, requires data from a representative number of rental houses. This project will look at rental housing stock to see how it differs from owner-occupied stock and will examine how rental stock could be suitably sampled for inclusion in the STAR Database.

CMHC Project Officer: Don Fugler

CIDN: 1766 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ENERGY CONSERVATION

SUPPORT FOR THE ENERNET STUDENT TRAINING NETWORK.

CMHC is contributing to a project by SIRICON using the Internet to educate students in 20 Québec high schools on the principles of building science and house energy auditing. The WEB site is now complete and schools are participating. SIRICON will report on the success of the venture in spring 1998.

CMHC Project Officer: Don Fugler

CIDN: 1822 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

UPDATING THE AIRTIGHTNESS TESTING STANDARD.

The airtightness testing standard, Canadian General Standards Board (CGSB) 149.10, was published in 1986 and requires updating and simplification. CMHC has engaged CGSB and a contractor to undertake this work in 1998.

CMHC Project Officer: Don Fugler

CIDN: 1971 0200001,
1971 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

UPGRADE OF STAR DATABASE.

The STAR database contains characteristics and performance data on approximately 1000 Canadian houses. It is used as the basis for statistical examinations of Canadian housing stock, largely for energy modeling. A contractor consulted with agencies or groups to determine their need for this data. Most groups contacted were provincially or regionally based and stated that they did not need a national database. As the prime users will be CMHC, Natural Resources Canada (NRCan), and their contractors, there is no need to simplify the database form for other users. About 200 houses are currently being added into STAR in the Residential Energy & Economic Simulator (REES) spreadsheet format. There were further additions from NRCan and about 35 Toronto houses from CMHC.

CMHC Project Officer: Don Fugler

CIDN: 1766 0300001

Division: Research Division

STATUS: Completed

AVAILABILITY: No report will be published

CLEANING UP YOUR HOUSE AFTER A FIRE.

This booklet, one of a series, will offer practical advice on what should be done to avoid health problems when moisture problems or calamities occur. After a fire there can be ongoing smoke and mold problems that can seriously affect the health of occupants. A point-form reference card, that is intended to be hung by the furnace, is also being written and will be available from fire departments.

CMHC Project Officer: Jim White

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

THE COSTS AND BENEFITS TO MUNICIPALITIES OF MANDATORY RESIDENTIAL FIRE SPRINKLERS.

This multi-year study is examining the financial impact on municipalities requiring all new housing to be sprinklered. A complementary study is assessing the change in risk. The work is being undertaken by Arencon Inc., Clayton Research, and the National Fire Laboratories/NRC and is funded by CMHC, the Ontario Ministry of Municipal Affairs & Housing and the Office of the Ontario Fire Marshall.

The study uses a case study approach to assess the changes in costs and benefits that could occur if municipalities were to adopt mandatory sprinkler requirements for all new residential construction. There are six case study sites: Barrie and Burlington, Ontario; Pitt Meadows, B.C; Edmonton, Alberta; Kawacatoose First Nation, Saskatchewan; and Gatineau, Québec. The data collection, interviews with municipal and fire officials, economic and risk analysis are completed. The results were presented for review at a stakeholder forum in December. Revisions have been made and the final draft is being circulated to stakeholders for a final review. The report is expected to be available in mid 1998.

CMHC Project Officer: Mark Holzman **CIDN:** 1235 0300002

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

DEVELOPMENT OF A NATIONAL ABORIGINAL LEARN NOT TO BURN (ALNTB) CURRICULUM (K-2).

The purpose of this project is to develop a national Aboriginal Learn Not to Burn curriculum (K-2) to serve as a companion resource book to the regular Learn Not to Burn program.

CMHC Project Officer: Alain Croteau **CIDN:** 1719 0300001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

FLOODS

THE JULY 1996 DISASTER IN THE SAGUENAY: THE EXPERIENCE OF REDEFINING A HABITAT.

The objective of this project is to understand and analyze the adaptation and integration mechanisms set up by families in rebuilding their homes following a natural disaster.

CMHC Project Officer: Marcel Boily, Chicoutimi Branch Office

CIDN: 1833 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Danielle Maltais, Université du Québec à Chicoutimi
555 de l'Université Blvd.
Chicoutimi, Quebec G7H 2B1

AVAILABILITY: Publication not yet available

HEATING & VENTILATION

APPAREILS DE COMBUSTION DE BOIS ET QUALITÉ DE L'AIR INTÉRIEUR.

From an economic standpoint, wood heating represents an alternative for Canadians. A number of people, however, are concerned about the potential deterioration of the ambient air quality in homes equipped with wood-burning appliances. The authors conducted a survey in the Quebec area to verify the significance of contamination from formaldehyde (HCHO), nitrogen dioxide (NO_2), breathable particles (PM10s) and carbon monoxide (CO) in houses with wood-burning appliances. In addition, they examined respiratory illnesses and symptoms among residents of homes heated partially or totally with wood.

A total of 89 adults and children took part in the study, with 1 adult and 1 child per residence. Among the homes, 59 were equipped with wood-burning appliances, and 30 were heated exclusively with electricity. Samples of HCHO, NO_2, PM10s and CO were taken in 49 houses (41 with a wood-burning appliance, 8 with no source of combustion products) for periods of 12 (CO) or 24 hours. Temperature and humidity readings were also taken. The respiratory symptoms of the participants (adults and children) were documented using a daily diary of symptoms. Data was also collected on home characteristics that were likely to deteriorate air quality.

In general, the contaminant concentrations measured were low for both houses with or without wood-burning appliances. In fact, and only for PM10s, 3 homes equipped with a wood heating appliance had contaminant levels higher than those recommended by Health Canada or the Environmental Protection Agency (EPA) respectively for indoor and outdoor air. Of these 3 homes, 2 had reasons other than the presence of a wood stove to explain the documented values. Still, the results, but especially the documented literature, showed that wood-burning appliances were likely to generate CO or PM10s.

Among the home variables most associated with the proportions of participants or the number of days of respiratory symptoms felt by the children or adults, the presence of animals or mould and a low frequency of open widows were documented. Residents living in homes with wood-burning appliances that had sustained combustion spillage, declared more respiratory illnesses and symptoms than those residing in houses either with a wood heating appliance with no spillage or else with no source of combustion products. There was no significant difference between the occupants of the last two housing categories.

The residents of homes equipped with wood-burning appliances should, just as all those living in residences with heating appliances likely to generate combustion products (regardless of the combustible), equip themselves with CO detectors. As well, in houses with wood-burning appliances, the presence of combustion spillage appears to be associated with an increase in respiratory illnesses and symptoms. A properly working, well installed, carefully maintained and adequately used appliance probably constitutes the best guarantee not only against fire and safety hazards, but also against the deterioration of indoor air quality and, consequently, the respiratory health of the occupants.

Prepared by Benoît Lévesque ... et al. CMHC Project Manager: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 1997. (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

EVALUATION OF RESIDENTIAL, IN-DUCT AIR FILTERS.

There are many residential air filters that have appeared in the last several years, providing an abundance of choice for consumers. Unfortunately, consumers have little objective information on the relative performance of these filters. This project will test the performance of different filters, from disposable fiberglass to electrostatic precipitators, in houses. The contractors will also look at how air filtration affects the levels of particulates (dust) in housing, and at the production of ozone by electrostatic precipitators. Pilot testing on the first house has illustrated the difficulty of making indoor particulate measurements. Pilot house testing is complete and five filter types will be tested in each of five additional houses through the winter and spring of 1997-98. A sample of houses with existing electrostatic precipitators will also be sampled for indoor ozone concentrations in summer 1998.

CMHC Project Officer: Don Fugler

CIDN: 1620 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HEATING & VENTILATION

FIELD SURVEY OF HEAT RECOVERY VENTILATION SYSTEMS.

This research assessed the ability of occupants to operate and maintain HRV systems and the effects of maintenance on system performance. It also evaluated the ventilation effectiveness of common HRV installation methods and several other innovative ventilation systems for new and retrofit installations. The project involved the inspection of 60 houses with heat recovery ventilation systems, a survey of the occupants to determine their understanding and usage of their ventilation systems, telephone surveys of a further 15 households and intensive performance testing of 20 conventional and four experimental ventilation systems.

The research concluded that common conventional approaches to HRV installation were capable of ventilating houses in an effective manner. The majority of the HRV systems inspected were used and the occupants believed that the use of the HRV system was beneficial. While most occupants understood the intent of the systems, few were fully aware of all of the considerations involved in the operation and maintenance of these relatively complex systems which was reflected in the condition of the HRV installations. The study found that considerable improvements are possible in installation practice, system performance, occupant understanding and interaction with their ventilation systems.

CMHC Project Officer: Duncan Hill

CIDN: 1376 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HVAC SYSTEMS OF MID AND HIGH-RISE RESIDENTIAL BUILDINGS.

An evaluation of the mechanical systems of 25 mid and high-rise residential buildings will be performed in order to determine the changes in design and installation practices required when the 1995 National Building and Energy Codes are adopted. Additionally, the performance of the mechanical ventilation systems will be assessed in 10 buildings in terms of design criteria, design procedures, system strategies and installed performance levels. This information will be used to produce advisory documents showing how to meet codes and improve system performance.

CMHC Project Officer: Duncan Hill

CIDN: 1424 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

IDENTIFYING AND REMOVING POLLUTANTS FROM HEAT RECOVERY VENTILATORS.

The objective of this project is to determine whether dedicated ventilation systems harbour unhealthy levels of dust, mould and/or fungi; whether existing duct cleaning methods are successful at lowering those levels; and to develop recommendations and guidelines for builders and homeowners for the maintenance of dedicated residential systems.

CMHC Project Officer: Don Fugler

CIDN: 1652 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Terry Watters
Rural Route #3, Comp 308
Wolfville, Nova Scotia, B0P 1X0

AVAILABILITY: Publication not yet available

INSPECTION OF DOMESTIC HEATING OIL TANKS.

The research covers work required to develop a practical, efficient and economical method of ascertaining the condition of functioning residential above ground oil storage tanks.

CMHC Project Officer: Darrel Smith

CIDN: 1829 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: William G. Moody, Moody Engineering Consultants
71 Newcastle Street
Dartmouth, Nova Scotia, B2Y 3M8

AVAILABILITY: Publication not yet available

1995 FIELD SURVEY OF INDOOR AIR QUALITY, AIRTIGHTNESS AND ENERGY CONSUMPTION PATTERNS OF NEW HOUSES.

CMHC, in partnership with Natural Resources Canada (NRCan - CANMET), characterized the indoor air quality, airtightness and energy consumption patterns of new single detached houses in Canada. The project represents an ongoing program to track the evolution of the Canadian stock and identify housing research priorities.The completed report, entitled "Airtightness and Energy Efficiency of New Conventional and R-2000 Housing in Canada, 1997" is available through NRCan - CANMET.

CMHC Project Officer: Don Fugler

CIDN: 1829 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: CANMET Energy Technology Centre
Energy Technology Branch, Energy Sector
Dept. of Natural Resources Canada
580 Booth Street, 13th Floor
Ottawa, ON K1A 0E4

or

Intellectual Property and Technical Information Management
Library & Documentation Services Division,
CANMET
Dept. of Natural Resources Canada
555 Booth Street, 3rd Floor, Room 341
Ottawa, ON K1A 0G1

PERFORMANCE QUANTIFICATION ON SINGLE WELL HEAT PUMP.

The objective of this project is to quantify the performance of an existing open loop ground source heat pump system which uses a single domestic water well for both its supply and discharge requirements, and to demonstrate that a single well can be used as both the supply and discharge source for open loop ground water heat pump systems.

CMHC Project Officer: Chris Ives **CIDN:** 1267 0200001

Division: Research Division, Housing Technology Incentives Program **STATUS:** Ongoing Project

Grant Recipient: Bob Vasily and Associates
RR #1
Seeley's Bay, Ontario, K0H 2N0

AVAILABILITY: Publication not yet available

RESIDENTIAL MECHANICAL VENTILATION MANUAL - FRENCH VERSION.

In partnership with Heating Refrigeration and Air Conditioning Institute (HRAI), CMHC is contributing towards the translation of the Residential Mechanical Ventilation manual which will be used to train designers and installers in the province of Québec. Once trained they will be certified by Hydro Québec to perform the ventilation work on houses being built under the "Nouveau Confort" program which is similar to the R2000 program. The manual will be completed by the fall of 1998.

CMHC Project Officer: Darrel Smith **CIDN:** 1904 0200

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

RESIDENTIAL MECHANICAL VENTILATION SEMINARS.

This is a partnership project between CMHC, HRAI and NRC. NRC will be responsible for the development of the material as well as the promotion and delivery of the seminars. HRAI will be the delivery agent. The objective is to develop and deliver a one day seminar on residential mechanical ventilation and the 1995 National Building Code requirements. It will cover the need for ventilation in relation to indoor air quality and the benefits that it will provide to the occupants. Common, affordable ventilation system options which satisfy the code requirements will be discussed in detail. Options will include systems that are coupled to ducted heating systems as well as those which are not. It will be targeted to builders and home inspectors. The seminar will be suitable for delivery in all provinces and territories which have adopted the 1995 NBC with delivery in major centres commencing June 1998.

CMHC Project Officer: Darrel Smith **CIDN:** 1972 0200001

Division: Research Division **STATUS:** Ongoing Project

NEW

TEMPERATURE CONTROL IN HOUSES.

A small project that measured air and concrete temperatures in 31 houses without power for a minimum of two weeks. Average outside temperatures during the period were -5°C to -10°C. All house interiors remained above 0°C, typically between 4°-7°C. No report will be published. The information will be used to provide better advice to homeowners during extended power outages.

CMHC Project Officer: Don Fugler

CIDN: 2025 0200002

Division: Research Division

STATUS: Completed

AVAILABILITY: No report will be published

VENTILATION AND HEATING SYSTEMS FOR NORTHERN CLIMATES.

In partnership with CHBA -Yukon and Yukon Housing Corporation, this first of a four phase three year project, will research the various ventilation and heating system options appropriate and acceptable for Northern climates. Field testing and monitoring their performance will also be conducted. This information will benefit the northern construction industry and may also be useful for increasing export potential of Canadian made ventilation systems.

CMHC Project Officer: Darrel Smith

CIDN: 2038 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

WHEN YOU REOCCUPY YOUR HOUSE AFTER A PROLONGED WINTER POWER OUTAGE.

As part of the *About Your House* Consumer Fact Sheet series and in response to the recent ice storm in Eastern Ontario and Quebec, a fact sheet on what steps you need to take when you return to your home during a prolonged winter power outage has been prepared. Tips are provided on turning on the heat, water, electricity, and roofing issues for when you reoccupy your home.

About Your House Fact Sheet; CE 11. Ottawa: Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE : Aussi disponible en français sous le titre : *À votre retour à la maison après une longue interruption de courant en hiver.*

HEATING AND VENTILATION

WOOD HEAT SAFETY IN AN EMERGENCY.

As part of the *About Your House* Consumer Fact Sheet series and in response to the recent ice storm in Eastern Ontario and Quebec, a fact sheet on wood heat safety in an emergency situation has been prepared. General tips are provided on getting the best out of wet wood, safe operation of wood stoves and fireplaces, temporary wood stove installation hazards and decorative fireplaces.

About Your House Fact Sheet; CE 10. Ottawa: Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642, Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE : Aussi disponible en français sous le titre : *Le chauffage au bois en toute sécurité lors d'une situation d'urgence.*

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

ADVISORY DOCUMENT ON MECHANICAL AND ELECTRICAL SYSTEMS IN MULTI-UNIT RESIDENTIAL BUILDINGS.

The technical report on the design of energy conserving equipment and systems providing plumbing, heating, ventilation and air conditioning, lighting and power in multiple-unit buildings has been reviewed by practitioners. The system design and installation practices noted in the report are being modified to reflect their comments. An advisory document to recommend "good engineering practice" for designers, owners and consultants should be available in late 1998.

CMHC Project Officer: Duncan Hill

CIDN: 1774 0300004, 5, 7

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BC MOISTURE PROBLEMS - COMPUTER SIMULATIONS.

This research will study the drying potential of various wall configurations and is intended to provide data to bolster recommendations to be incorporated in the Localized Best Practice Guide. The information will be prepared as a guide for construction practices in the Lower Mainland of British Columbia. As the cost of doing all the tests proposed may be prohibitive, it was recommended that computer simulation WALLDRY be used to determine which walls might be more promising to test than others, potentially leading to a reduction in the cost of the test program.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816 0300004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

BC MOISTURE PROBLEMS - ENVELOPE DRYING RATES EXPERIMENT.

Findings from the 'Survey of Building Envelope Failures in the Coastal Climate of British Columbia' revealed that the construction of walls with face seal or concealed barrier systems does not promote rapid drying of wall assemblies once the moisture has saturated the moisture barrier and passed into the sheathing. The solution to promote drying of the wall assembly has been to introduce an air cavity behind the claddings. The objective of this project is to identify, through laboratory work, a range of cavity and vent configurations which will provide wall drying capability characteristics necessary to deal with the coastal British Columbia climate.

CMHC Project Officer: Jacques Rousseau
CIDN: 1816

Division: Research Division
STATUS: Ongoing Project

AVAILABILITY: Publication not yet available
* NEW *

BC MOISTURE PROBLEMS - HYGROTHERMAL PERFORMANCE OF STUCCO.

The project objectives are to develop fundamental and applied understanding of the hygrothermal performance of stucco based wall systems for Vancouver, B.C. weather conditions. The properties will be investigated through laboratory evaluation. The long term hygrothermal behaviour of the building envelope components will be simulated using the LATENITE computer program. The result of the work will guide the "Envelope Drying Rate Analysis" study. The work is being collaboratively funded with the NRC/Institute for Research in Construction and is part of the recently launched Consortium on Moisture Control Strategies of Wall Systems.

CMHC Project Officer: Jacques Rousseau
CIDN: 1816 0300007

Division: Research Division
STATUS: Ongoing Project

AVAILABILITY: Publication not yet available
* NEW *

BC MOISTURE PROBLEMS - LOCALIZED BEST PRACTICE GUIDES.

This project will produce supplements to the "Best Practice Guide for Wood Frame Building Envelopes" and the "Best Practice Guide for Flashings" specific to British Columbia coastal climate construction. The new document must deal with the conclusions, recommendations and the seventeen problem details identified in the "Survey of Building Envelope Failures in the Coastal Climate of British Columbia", November 1996 by Morrison Hershfield, for CMHC. This project has been undertaken in collaboration with the Building Envelope Research Consortium and the Canadian Wood Council. The reports will be published as national documents available through CMHC.

CMHC Project Officer: Jacques Rousseau
CIDN: 1816 0300003

Division: Research Division
STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

B.C. MOISTURE PROBLEMS - QUALITY ASSURANCE PROTOCOL.

The objective of this study is to produce a locally relevant protocol which will form the baseline quality management system for the exterior envelope of 3 and 4 storey wood frame construction in British Columbia. The protocol deals with the conclusion and recommendations identified in the 'Survey of Building Envelope Failure in the Coastal Climate of British Columbia". The protocol will also tie into the "Best Practice Guide for Wood Frame Construction in the Coastal Climate of British Columbia" which is currently under development.

CMHC Project Officer: Jacques Rousseau — **CIDN:** 1816 0300006

Division: Research Division — **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available — *NEW*

BC MOISTURE PROBLEMS - SMALL SCALE TESTING AND DEVELOPMENT PROTOCOL.

This work results from the conclusions and recommendations of the "Survey of Building Failures in the Coastal Climate of British Columbia". The intent of this initial testing project is to give the industry some sense of what will or will not work and examine the sensitivity of the various systems to specific variables. The testing will provide a relative comparison under a specific set of environmental conditions. Although the work will not provide a definitive solution, it will serve to provide guidance regarding the use of some proposed new assemblies. The work will also develop protocol for the "Envelope Drying Rate Analysis" which is currently planned. The work is being funded in collaboration with the NRC/Institute for Research in Construction, the City of Vancouver, Van Maren Limited, Centreville Limited and Aquastap Limited.

CMHC Project Officer: Jacques Rousseau — **CIDN:** 1816 0300005

Division: Research Division — **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available — *NEW*

BEST PRACTICE GUIDE: BUILDING ENVELOPE DESIGN FOR BRICK VENEER/STEEL STUD WALL ASSEMBLIES.

The objective of this project is to prepare a "best practice" guide for steel stud exterior wall construction. The document will contain details, specifications, sequence of construction and inspection/commissioning information. The document will be available in paper copy and on CDRom. A series of seminars will present the information and issues raised in the guide.

CMHC Project Officer: Sandra Marshall, Research Division — **CIDN:** 1930 0200001

AVAILABILITY: Publication not yet available — **STATUS:** Ongoing Project

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BEST PRACTICE GUIDE: BUILDING ENVELOPE DESIGN FOR WOOD FRAME WALL ASSEMBLIES.

The objective of this project is to prepare a "best practice" guide for various exterior wall assemblies with wood frame construction. The document will contain construction details, specifications, sequence of construction and inspection/commissioning information. The document will be available in paper copy and on CD ROM.

CMHC Project Officer: Sandra Marshall, Research Division — **CIDN:** 1930 0200001

AVAILABILITY: Publication not yet available — **STATUS:** Ongoing Project

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

BEST PRACTICE GUIDE - FIRE AND SOUND ASSEMBLIES FOR MULTI-FAMILY BUILDINGS.

This document, targeted at designers of multi-family buildings, will provide the latest information on CMHC research into fire and sound partitions, floors, flanking, plumbing noise, etc. The document is being produced in collaboration with the NRC/IRC.

CMHC Project Officer: Ken Ruest

Division: Research Division

AVAILABILITY: Publication not yet available

CIDN: 1804 0300003

STATUS: Ongoing Project * NEW *

BRICK VENEER CONCRETE MASONRY UNIT BACKING. BEST PRACTICE GUIDE: BUILDING TECHNOLOGY.

One of the major contributors to envelope defects has been a failure to apply existing knowledge of envelope construction in the form of details that builders can use during construction. The Best Practice Guide series is intended to encourage state-of-the-art construction by providing detailed description and CAD details of building features that can be adapted and developed by professionals to suit the particular conditions of their buildings.

Chapters 1 and 2 of this guide describe the various components and materials used in brick veneer/concrete masonry unit backing. They also provide references to relevant industry standards.

Chapters 3 outlines the building science concepts that underpin the CAD details in the rest of the guide.

CAD details in Chapter 4 illustrate such features as window sills, parapets, curtain walls and patio doors. Explanatory notes outline how each feature works, and checklists are provided for designers and builders. An accompanying diskette contains AutoCAD files of the details in chapter 4.

Chapter 5 supplements the earlier descriptions with specifications for masonry wall design and construction. Chapters 6 to 8 deal with construction sequencing, inspection, quality control and commissioning the building envelope. Chapter 9 offers guidance on maintenance and repair.

A reference section lists other useful publications on masonry construction, design and research. The appendix is a guide to the use of the diskettes.

Prepared by Ashok Malhotra and Herb Otto. Ottawa: Canada Mortgage and Housing Corporation, 1997.

Order number: 6917E. ** Price: $89.00 + GST and handling charges.

Binder format + 24 Easy to use CAD drawings on CD-ROM.

The CD-ROM CAD drawings are PC format and convertible to MAC format (instructions provided in the guide). This product is sold as a package. The CD-ROM is not available separately.

STATUS: Completed Report

AVAILABILITY: CMHC Information Products
700 Montreal Road
Suite 1000
Ottawa, Ontario
K1A 0P7
Tel: 1-800-668-2642 or 1-800-668-2642
Fax orders from Canada: 1-800-245-9274
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre : *Fonds en blocs de béton et placage de brique (6918F).*

BUILDING ADAPTABILITY: A SURVEY OF SYSTEMS AND COMPONENTS.

This report looks at current theory and technology from exhaustive international sources addressing the adaptability of buildings. In light of this, actual Canadian case studies are considered and some guidelines are formulated for designers facing the opportunities and problems associated with adaptability. The outcome of the research is seen as an information tool for designers and builders. The work is primarily concerned with medium-rise to high-rise construction, and the scope of research is focused on but not restricted to residential programmes.

The study reviewed historical, social and design perspectives on why and how buildings change and identified the two fundamental and complementary approaches to adaptability: one based on design and another based on technology. These approaches were then tested through the examples of ten building conversions. This process yielded nine principles that could be followed during the design process of a building. In implementing these principles, a number of options in systems and components become possible and these are explained in a set of guidelines that relate specifically to elements of the building envelope, structure and environmental systems.

The study asserts that awareness of the potential for adaptability could in itself be a significant factor in designing adaptable buildings; when enhanced with the knowledge of principles and practical guidelines it could be a decisive factor in increasing a building's future potential and its environmental benigness.

Prepared by Young & Wright Architects Inc., in association with Engineering Interface Limited and Yolles Building Science Services Limited. Ottawa: Canada Mortgage and Housing Corporation: CANMET, Natural Resources Canada, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

CASE STUDIES FOR INNOVATIVE TECHNOLOGY AND SOLUTIONS IN SUCCESSFUL MULTI-FAMILY HOUSING.

Successful innovative Canadian multi-family residential buildings are being identified and documented for future monitoring. Areas such as durable building envelope, energy savings, life-cycle costs and environmentally responsive solutions will be evaluated. One multi-family residential building, the Conservation Co-operative, was selected for evaluation to be presented at the Green Building Challenge in Vancouver in the fall of 1998.

CMHC Project Officer: Sandra Marshall

CIDN: 1817 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CASE STUDY OF THE RENOVATION OF AN APARTMENT BUILDING WITH SOLID MASONRY WALLS.

A 90 year old commercial building with solid masonry walls has been gutted and renovated into a residential building for low income single persons. The renovation involved the addition of thermal insulation to the building envelope, the application of stucco to the exterior of three of the four sides of the building, restoration to the front masonry facade, installation of a balanced mechanical ventilation system and a combination hydronic baseboard/radiant floor heating system. The building envelope is being monitored to provide an indication of its potential long-term performance. Energy and water use and indoor air quality will also be monitored in the renovated building to assess the strengths and weaknesses of the renovation strategy. A case study will be produced to document the work undertaken and the results of the performance monitoring.

CMHC Project Officer: Duncan Hill

CIDN: 1730 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

COMPARTMENTALIZATION OF EXISTING HIGH-RISE APARTMENT BUILDINGS.

The purpose of the project is to determine the practicality of compartmentalizing existing apartment buildings and determining the effectiveness of compartmentalization on controlling unwanted air change, energy costs and comfort problems.

CMHC Project Officer: Duncan Hill

CIDN: 1655 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Mark Lawton Building, Science Specialists and
Morrison Hershfield Limited
2440 Don Reid Drive
Ottawa, Ontario, K1H 8P5

AVAILABILITY: Publication not yet available

ENVIRONMENTAL IMPACT ASSESSMENT TOOLS FOR MULTI-UNIT HOUSING.

This project will assess 6 different environmental assessment tools to determine their applicability to multi unit residential buildings. The best features and limitations of each tool will be identified and transmitted to the authors of each tool. Four innovative buildings will then be assessed by one of the tools. This work will be presented to the GBC '98 committee as part of CMHC's contribution to the development of the residential component of the GBC core evaluation criteria.

CMHC Project Officer: Cate Soroczan

CIDN: 1872 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ESTABLISHING THE FEASIBILITY AND FRAMEWORK FOR A MULTI-FAMILY HOUSING DATABASE.

CMHC is in the process of determining the feasibility of establishing a nationally representative multi-family housing database. Anticipated uses for such a database include, studies of the impact of energy retrofits on the energy consumed and pollutants emitted by multi-family housing. With an appropriate level of data, repair and replacement trends impacting on condition and resource requirements for this form of housing, could be identified. The project will identify the uses of such a database, subsequent data requirements, the quantity, quality and availability of data and a database format and management system. Based upon the findings of this project, CMHC will make a decision whether or not to pursue the development of a multi-family housing database.

CMHC Project Officer: Duncan Hill

CIDN: 1805 0800001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

EXPORTING CMHC'S TECHNICAL SEMINAR SERIES.

Over the past fifteen years, CMHC has undertaken research work into the development of technologies for highrise buildings. The work could be marketable in the US and other countries where they are being faced with similar concerns regarding energy efficiency, airtightness, noise control and rain penetration control of the building envelope. CMHC's research activities into the building sciences were undertaken by Canadian consulting firms who have gained considerable knowledge that could also be marketed in other countries. A pilot series of seminars will be conducted in the USA in partnership with the Energy Efficient Building Association.

CMHC Project Officer: Ken Ruest

CIDN: 1928 0200

Division: Research Division

STATUS: Planned

AVAILABILITY: Publication not yet available

*** NEW ***

FIELD INVESTIGATIONS OF INDOOR ENVIRONMENT AND ENERGY USAGE IN MID-RISE RESIDENTIAL BUILDINGS.

The focus of this study was to evaluate the thermal and indoor environment performance of mid-rise buildings, more specifically three to five storey apartments. The research plan included the development of test and evaluation protocols for indoor environment parameters, energy consumption patterns and ventilation system performance parameters for mid-rise buildings. As part of the field work, a total of eight buildings were chosen for detailed evaluation; four buildings in Vancouver, two in Ottawa and two in Toronto. All the buildings were built in the last five years (1990 or later) to reflect current design and construction practices.

Mid-rise residential buildings had the necessary ventilation and exhaust equipment installed to meet the code requirements. However, the performance evaluation showed that these exhaust and ventilation systems did not function to the required level and generated significantly low air movement in the building. Make-up air systems provided the fresh air in corridors which eventually dumped to the outside due to a lack of proper transfer mechanism between the corridor and the suites. The under-performance of ventilation systems also seem to cause high levels of relative humidity, high levels of carbon dioxide, window condensation and mold growth in several buildings. In several buildings, relative humidity and carbon dioxide levels exceeded the normal acceptable limits set by Health Canada Guidelines. These buildings also had insufficient ventilation and air movement in the suites. Occupant complaints are also high. The occupant complaints in these buildings seem to be due to improper and/or lack of adequate ventilation and air distribution.

Comparison showed that the mean value of the energy consumption for a high-rise and mid-rise building is almost the same. Compared to a single family house, the mid-rise residential units had about 10% less energy consumption per unit area despite the fact that mid-rise units had significantly less exposed surface area than single-family houses. Overall, the field survey and energy analyses provided significant new insights into the mid-rise apartment buildings. These findings should help in future design, construction and commissioning of apartment buildings.

Prepared by Scanada Consultants Limited. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: Duncan Hill. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

FIRE RESISTANCE AND SOUND TRANSMISSION OF FLOOR ASSEMBLIES.

This project, currently in 'draft' stage, measured and developed a database of fire and sound ratings on selected floor assemblies and is a continuation of a recently completed joint NRC/IRC and CMHC project which established the sound and fire resistance ratings of 160 wall assemblies.

CMHC Project Officer: Ken Ruest

CIDN: 1697 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

FLANKING NOISE II (SOUND AND FIRE PERFORMANCE OF FIRESTOPS IN MULTI-FAMILY DWELLINGS).

This project, undertaken in collaboration with NRC/IRC, looked at remedial measures for existing construction and the redesign of fire stops, which are a major source of flanking noise transmission in multi-unit construction. The project is complete and the final report is available through CMHC.

CMHC Project Officer: Ken Ruest **CIDN:** 1316 0301001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

GOVERNOR'S ROAD AND SPENCER CREEK VILLAGE PROJECT, DUNDAS, ONTARIO.

The purpose of this project was to carry out the CMHC Healthy Housing and IDEAS Challenge objectives on the Governor's Road and Spencer Creek Village project in Dundas, Ontario.

CMHC Project Officer: Sandra Marshall **CIDN:** 0840 0309007

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

GUIDELINES FOR THE RETROFIT OF UNINSULATED MASONRY WALLS.

In cooperation with NRC's Institute for Research in Construction, a project has been initiated to assess common forms of solid masonry walls in commercial and residential buildings and current energy retrofit strategies. Investigations of previously retrofitted walls are being performed to determine the impact on the durability of the building envelope.

CMHC Project Officer: Duncan Hill **CIDN:** 1730 0300003

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

IDEAS HIGH-RISE CHALLENGE.

The IDEAS Challenge is intended to demonstrate the benefits of innovative design and technology in the operation of high-rise residential buildings. The Challenge focuses on five aspects of building design: envelope durability, energy efficiency, indoor air quality, environmental conservation and accessibility. One project in Montreal is built and monitoring is being carried out. Acoustic details have been tested. Two booklets are available, one that describes the IDEAS Challenge and the features of the five finalist projects and another which is a "Better Building" guide to innovation in the design and construction of high-rise residential buildings. The design process of a building in Dundas, Ontario which is exploring the adaptation of the IDEAS Challenge goals and details of CMHC's Best Practice Guide, is being documented.

CMHC Project Officer: Sandra Marshall **CIDN:** 0840 0300

Division: Research Division **STATUS:** Ongoing Project

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

INVESTIGATION OF SMOKE CONTROL IN HIGH-RISES BY POSITIVE PRESSURE VENTILATION.

A research project is being developed to study the use of positive pressure ventilation (PPV) systems to contain and expel smoke from high-rise buildings during a fire emergency. PPV systems have been used in the U.S. in low-rise buildings. The system consists of a portable, high velocity fan which is used by the fire department to clear smoke from buildings in order to facilitate access to the fire and to aid in occupant evacuation. Prelimary studies have been conducted in multi-unit residential buildings but not in cold climates where stack effect may continue to dominate smoke movement. The research program is the result of a joint venture between CMHC, the City of Ottawa Fire Department and the Fire Laboratory of the Institute for Research in Construction of NRC. The ability of PPV to contain and clear smoke from exitways in high-rise buildings will be evaluated at the Fire Laboratory's full scale test building under both summer and winter conditions. If successful, PPV may offer Fire Departments an effective, low cost life and property saving tool.

CMHC Project Officer: Duncan Hill | **CIDN:** 1983 0200002

Division: Research Division | **STATUS:** Planned

AVAILABILITY: Publication not yet available | *NEW*

MONITORING INNOVATIVE MECHANICAL AND ELECTRICAL SYSTEMS.

The innovative mechanical and electrical energy consuming and producing systems in high-rise housing at a recently completed housing project in Peel, west of Toronto, are being monitored. A gas-fired cogeneration system was installed that provides electricity and thermal heat to the building. The building's owners are concerned that the system is not performing in an economically viable manner. An extensive monitoring and performance assessment is underway to evaluate system performance. The cost of energy provided to the building by the cogeneration system in terms of fuel consumption, maintenance expenditures, avoided utility invoicing and other considerations will be assessed. The performance and cost of the cogeneration system will be compared to other alternative but more conventional options.

CMHC Project Officer: Duncan Hill | **CIDN:** 1260 0800001

Division: Research Division | **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

MONITORING THE RETROFIT OF A RESIDENTIAL HIGH-RISE BUILDING ENVELOPE.

A case study of a 20 year old high-rise building in Toronto has been undertaken to document and monitor the performance of the retrofitted walls. In November 1997, an Exterior Insulating Finish System (EIFS) was installed over the precast block walls as part of an overall building renewal project. Instrumentation to monitor heat, air and moisture regimes within the wall sections was installed which is currently being monitored for one year to assess the performance of the retrofit strategy. Preliminary results indicate that the walls are performing in a satisfactory manner but an assessment of the full year's monitoring will be necessary.

CMHC Project Officer: Duncan Hill | **CIDN:** 1602 0800001

Division: Research Division | **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

OPERATING AND MAINTENANCE BOOKS FOR MECHANICAL AND ELECTRICAL SYSTEMS IN MULTI-UNIT BUILDINGS.

Two publications, currently in 'draft' stage, on improving the operating performance of modern residential building systems have been developed. The first document, for owners and managers, links good operating practices with desirable investment strategies. The second, for building operating and maintenance staff, updates information on mechanical and electrical systems and incorporates preventative maintenance checklists for multi-unit residential buildings.

CMHC Project Officer: Jacques Rousseau

CIDN: 1774 0300004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PERFORMANCE MONITORING: BRICK VENEER/STEEL STUD (BV/SS) WALL SYSTEM: PHASE 4.

Phase 4 of this study involves a fourth year (1997/98) of in-situ performance monitoring of a BV/SS wall system, with respect to air and moisture movements after the top vents in the brick veneer wall have been opened. The performance of a wall is being monitored using temperature, moisture and air pressure sensors connected to an automatic data logging system. Preliminary results indicate that the vent holes did not contribute to drying the wall but increased the moisture loading of the brick veneer. Even though the BV/SS wall system is typical of current practices and workmanship was satisfactory, the results of the study demonstrate that performance problems exist that may lead to significant distress over the long term. The more serious performance problems identified in this study are due to design weakness demonstrating the need to improve design and construction standards. Phase 1 & 2 reports are available from CMHC. The results of the Phase 3 research demonstrated no significant difference from Phase 1 and 2 and the Phase 4 draft report has been received.

CMHC Project Officer: Jacques Rousseau

CIDN: 0787 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PROTECTING GYPSUM SHEATHING IN INSULATED STEEL-STUD WALLS.

The purpose of this project is to prepare and test wall systems that include combinations of three different warm face treatments and six different cold side materials. The warm face of the wall systems will be treated in one of the following ways: no protection; a vapour permeable but water repellent membrane such as Tyvek or Typar; a vapour barrier such as polyethylene.

CMHC Project Officer: Jacques Rousseau

CIDN: 1282 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Kim Pressnail, University of Toronto
35 St. George Street
Toronto, Ontario, M5S 1A4

AVAILABILITY: Publication not yet available

RAIN CONTROL BEST PRACTICE GUIDE.

This document, currently in the 'draft' stage, provides the latest information on controlling the penetration of rain into walls. It is based on CMHC's research and other information regarding rain penetration control. The work is being funded in collaboration with the American Architectural Manufacturers Association.

CMHC Project Officer: Jacques Rousseau

CIDN: 1258 0300004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RAINSCREEN 2.1 COMPUTER PROGRAM

The RAINSCREEN program was developed to assist in the design of rainscreen pressure equalized wall assemblies. This project is aimed at producing a new version of the RAINSCREEN computer program, including a tutorial program and a manual that will be much more user-friendly. The work involves adapting the existing program to Windows and Mac environments and validating the program to laboratory test results to increase user confidence in the program. The BETA IBM version of Rainscreen 2.1 (English only) is available through e-mail (jroussea@cmhc-schl.gc.ca). The program is being updated to offer a better interface to determine the effects of the air barrier and cladding flexibility.

CMHC Project Officer: Jacques Rousseau

CIDN: 1258 0300005

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

REPAIR AND RETROFIT CASE STUDIES FOR MULTI-UNIT RESIDENTIAL BUILDINGS

CMHC is documenting repair and retrofit activities in multi-unit residential buildings. The first 30 case studies will document building characteristics, the type of problems that prompted the repairs and retrofits, costs, benefits, etc. A wide range of case studies will be included to reflect regional repair and retrofit priorities. The studies will be useful for other members of the multi-unit residential building industry to refer to when considering similar projects. An information template that can be used as a guideline for the type of information that should be extracted from a repair or retrofit project in a multi-unit residential building has been developed. CMHC is currently soliciting the building industry for case studies and will retain consultants to provide the necessary documentation. A compendium of case studies will be assembled and made available to the members of the housing industry.

CMHC Project Officer: Duncan Hill

CIDN: 1782 0300001-7

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

TECHNICAL AUDIT OF APARTMENT BUILDINGS IN TORONTO

A representative sample of 63 multifamily rental buildings in Toronto have been audited in order to determine their condition. The buildings were examined to determine their durability, and health and fire safety aspects, and the related repair costs. The project is a joint initiative with the City of Toronto. Preliminary results show the repair costs to be approximately $580/unit/year, for ten years, not including regular maintenance or finishings.

CMHC Project Officer: Sandra Marshall **CIDN:** 1537 0300001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

WIND-DRIVEN RAIN FOR THE GOVERNOR'S ROAD PROJECT.

The objective of this project is to carry out the impact study of Wind-Driven Rain for the Governor's Road project and the effect of variations of the parapet/cornice at the top of the building.

CMHC Project Officer: Sandra Marshall **CIDN:** 1123 0300013

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

HOME AUTOMATION

HOME AUTOMATION - VOICE COMMUNICATION SOFTWARE.

The objective of this project is to review current and proposed voice recognition software with potential for home automation applications and test the speech capabilities, and compare them with what is proposed for development in this project.

CMHC Project Officer: Tom Parker **CIDN:** 1397 0200001

Division: Research Division, Housing Technology Incentives Program **STATUS:** Ongoing Project

Grant recipient: Daimac Developments
835 Carlaw Avenue
Toronto, Ontario, M4K 3L8

AVAILABILITY: Publication not yet available

HOME OWNERSHIP

A CANADIAN HOMEOWNER'S MANUAL.

This project will respond to the information needs of the housing consumer and develop an owner's manual that is comprehensive and specific to each house. The manual will be of interest to homebuilders as a marketing and service tool and for reducing callbacks; and to the warranty programs as a means of conveying good house maintenance and operation practices to the home owner. A national advisory committee was created to oversee the evolution of the manual and to ensure that the views and experience of builders and warranty programs are considered. Focus group testing was conducted first on the idea of the manual and subsequently on the completed draft version. Consumers were enthousiastic about the idea and praised the product. The draft text of the manual is ready and it will now be edited for publication which is scheduled for June 1998.

CMHC Project Officer: Fanis Grammenos

CIDN: 1559 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSE CONSTRUCTION

APPLICATION OF STRUCTURAL STEEL TO SINGLE-FAMILY RESIDENTIAL CONSTRUCTION.

The objective of this project is to investigate the use of structural steel in single-family residential construction, and analyze its applicability to Canada, taking into account technical requirements, cost-effectiveness and sustainability.

CMHC Project Officer: Rob Duncan

CIDN: 1831 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Michel De Spot, Director, Node Engineering
2703 124B Street
Surrey, British Columbia, V4A 3N8

AVAILABILITY: Publication not yet available

HOUSE CONSTRUCTION

BUILDERS' SERIES PUBLICATIONS.

The "Builders Series" publications will be available in June 1998 as a one, all inclusive, book that details construction defects, problems, causes and solutions. The new title will be "Building Solutions: A Problem Solving Guide for Builders and Renovators". The chapters of this document will reflect the information from the former modules and include, "Foundations"; "Floor Systems"; "Wall Systems"; "Roof and Ceiling Systems"; "Indoor Air Quality and Ventilation"; and "Noise Control" and also include recent research results.

CMHC Project Officer: Darrel Smith
CIDN: 1993 0200001

Division: Research Division
STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CMHC EARTHQUAKE RESISTANCE: GUIDE FOR UPGRADING EXISTING WOOD FRAME HOUSES.

This publication is targeted at the builder/renovator and D-I-Yer audiences and provides information on improving the earthquake resistance of new and existing homes. The document contains information on understanding earthquakes and how houses react to them, evaluating the house, property and contents and contains decision making processes for upgrading houses. There will also be a brochure titled, "How Would Your Home Stand Up?" which will provide information and a checklist for consumers. The advisory document will be available in June 1998.

CMHC Project Officer: Darrel Smith/Mark Salerno
CIDN: 1355 0301001

Division: Research Division
STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CSA Z-824 STANDARD.

The objective of this project is to take the existing draft of the CSA Z-824 Log Standard, rationalize the organization of the standard contents, and produce a draft for comment.

CMHC Project Officer: Rob Duncan
CIDN: 1811 0300001

Division: Research Division
STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

DEVELOPMENT OF COMMERCIALLY VIABLE CONCEPTS AND A DESIGN FOR A RESIDENTIAL FRAMING SYSTEM FOR A MONOCOQUE HOUSE.

The purpose of this project is to undertake the development of commercially viable concepts and a design for a residential framing system for a monocoque house, to provide on-site guidance during the construction of prototypes of the design and to undertake post construction performance monitoring of the structures.

CMHC Project Officer: Rob Duncan
CIDN: 0657 0300001

Division: Research Division
STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

EASY-ACCESS THRESHOLDS TO BALCONIES: PROBLEMS AND POSSIBLE SOLUTIONS

The objective of this project is to provide architects, builders, developers and regulatory agencies with a tool demonstrating the possibilities of producing easy-access thresholds to balconies in new or renovated residential buildings.

CMHC Project Officer: Sandra Marshall

CIDN: 1995 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

NEW

Grant Recipient: Pierre Richard
4800 Marquette Street
Montreal, Quebec, H2J 3Y7

AVAILABILITY: Publication not yet available

ISSUES PAPER ON LIABILITY IN HOUSE CONSTRUCTION.

The Canadian Home Builders Association (CHBA) has expressed a concern that, in housing construction, it is becoming less clear who is liable for specific aspects relating to the house. They also are concerned that, as a result of cutbacks, municipalities are not carrying out inspections to the extent they once did and may be losing the capacity to properly enforce building regulation. This joint project, co-funded by CMHC and CHBA and managed by CHBA, will produce a paper discussing the issue of liability in housing construction across Canada and identify who is and is not liable. It will serve as the basis for discussion on these issues and for further study. The National Research Council (NRC) will also be a participating partner as the agency responsible for code development. An initial draft has been prepared and the project has been extended to include provincial consultations at CHBA's request.

CMHC Project Officer: Mark Holzman

CIDN: 1920 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

LABOUR SHORTAGES IN RESIDENTIAL CONSTRUCTION.

The purpose of this project is to examine the available evidence concerning the extent of labour shortages in the residential construction industry; and document the overall labour supply situation in the residential construction industry.

CMHC Project Officer: Jamie Angus

CIDN: 1860 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSE CONSTRUCTION

RE-USE: INTEGRATION OF USED BUILDING MATERIALS INTO NEW CONSTRUCTION.

The objective of this project is to promote the practice of re-use of building materials as a viable approach in the 3Rs of sound environmental practice for the construction industry, presently including waste management through recycling and reduction. Research will address 4 main concerns: economic, environmental, legislative/practical and perceptual -- presently barriers to viability in practice.

CMHC Project Officer: Darrel Smith

CIDN: 1842 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Mark Poddubiuk, Pearl Poddubiuk Architects
995 Girouard
Montreal, Quebec, H4A 3B9

AVAILABILITY: Publication not yet available

STUDY OF SEAM TELEGRAPHING IN RESIDENTIAL FLOORING.

A CHBA led research project was conducted, in partnership with Macmillan Bloedel, the Canadian Plywood Association, the Canadian Particleboard Association, the Industrial Research Assistance Program of N.R.C. and CMHC. This research identified that the seam telegraphing problems in residential flooring currently being experienced by the housing industry are predominantly attributable to site conditions which lead to complex interactions between layers of materials. Of greater significance than that of material type, are the installation practices followed. Moisture problems, for a number of different reasons from material acclimation to construction material generated moisture (ie: floor slabs), are the main reason for this problem. A full report will be available from the CMHC Canadian Housing Information Centre and through other stakeholders in June 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1729 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

"TALL WALL" CONSTRUCTION DETAILS.

The purpose of this project is to develop a series of cost-effective, common design and construction details, certified by a structural engineer registered in the province of Alberta, for typical "tall walls", such as walls exceeding the maximum height permitted by the building code. The project and development of the report/booklet will be managed by the Alberta Home Builders' Association on behalf of the Alberta Housing Industry Technical Committee (AHITC). AHITC is an alliance of major organizations (builder associations, Alberta New Home Warranty Program, Municipal Authorities and CMHC) which serves as the technical forum for the residential sector in Alberta. AHITC will be responsible for the production and the distribution of the booklet to their members.

CMHC Project Officer: Darrel Smith

CIDN: 2037 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

AFFORDABLE, VERSATILE HOUSING.

This project will identify and describe house designs that enable a house to accommodate a range of housing types, sizes and needs by means of their adaptability. It will document the features of designs that have been built and it will explain their economic and use advantages. The set of designs to be included will cover all housing forms, from detached houses to apartments. This first guide on adaptable designs will be made available both in hard copy and electronic format via the Internet. The final report will be available in August 1998.

CMHC Project Officer: Fanis Grammenos

CIDN: 1783 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

DESIGNING NEW HOUSING FOR FUTURE DECONSTRUCTION.

The objective of this project is to facilitate easier de-construction in order to obtain maximum reuse and recycling of building components in a cost-effective and timely manner.

CMHC Project Officer: Darrel Smith

CIDN: 1828 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Vince Catalli, By Design Consultants
24 Spruce Street
Ottawa, Ontario, K1R 6N7

AVAILABILITY: Publication not yet available

FLEXHOUSING DESIGN DEMONSTRATION PHASE.

In January 1996, CMHC launched the FlexHousing Design Competition. The objective of the competition was to encourage the housing industry to explore new design concepts that integrate adaptable features into new housing. A national committee of community housing professionals judged the finalists in January 1997 and chose one national winner and three awards of merit. The national winner is Nouvelle Development Corp. of London Ontario. Awards of merit were given to: Ron Wickman Architects of Edmonton; Mcgill Unniversity, Avi Friedman, Anobid Construction of Montreal; Stephane Hazan Architects of Laval. The first demonstration house opened in Edmonton in October 1997. Additional demonstration houses will open in mid 1998. The project is one step in a long term CMHC initiative to promote accessibility and adaptability. More information is available on the CMHC Home page.

CMHC Project Officer: Tom Parker

CIDN: 1389 0300

Division: Research Division

STATUS: Ongoing Project

HABITATION ET FLEXIBILITÉ AU CANADA : BILAN 1991 : LA FLEXIBILITÉ VUE PAR LES ARCHITECTES.

The main objective of this research was to carry out a precise analysis of the architectural solutions provided by Canadian architects for solving the problem of flexibility, presented as a criterion in the "Vivre en Ville" competition launched by the City of Montreal in partnership with the Canada Mortgage and Housing Corporation and the Société d'habitation du Québec.

This research has allowed the preparation of an inventory of the broad trends among the majority, as well as minority forms of expression that can be qualified as innovative. Inspired by considerations that were more social than technical, architects have first and foremost focused their thinking on the practicality and speciality of dwellings within the problematics of passing time. No model of flexibility that would be generally applicable to all operations without adaptation has emerged from the research. Architects responded in a balanced way by favouring a context-based approach (type of operation, clientele, site, etc.), occasionally providing several practical solutions in the same project.

To respond to the multiple variations of residential groups and lifestyle changes that are currently observable in Western society, flexibility remains a major operating concept for the various housing stakeholders whether in policy, demand, programming or housing design, if we are to be responsive to occupants' expectations and to the goal of sustainable, lasting housing.

Prepared by Annie Chélin. CMHC Project Officer: Maria Hanna Siedlikowski. Ottawa: Canada Mortgage and Housing Corporation, 1997. (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NEW HOMES IN OLD ENVIRONMENTS

The research project addresses the design problems raised by the implementation and integration of new homes in Canadian residential environments with more or less homogenous construction or in their bordering zones. By extension, this project concerns any new construction in an old environment, whether it involves recycling, renovation or expansion.

CMHC Project Officer: Glynis Kossatz

CIDN: 1450 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Pierre-Richard Bisson, Université de Montréal
P.O. Box 6128, Station CV
Montréal, Quebec H3C 3J7

AVAILABILITY: Publication not yet available

LIGHT, SITE DENSITY AND FORM: A STUDY OF DAYLIGHT AVAILABILITY IN CANADIAN RESIDENTIAL BUILDINGS.

Natural lighting has been linked to physiological and psychological beneficial effects on humans. In general it is desirable and preferable to electric lighting. Recognizing that a large and increasing amount of our daily activity cycle is spent indoors, the questions this project addresses are: What are the light levels found in residential buildings of various forms and in different settings? Can these levels be predicted on the basis of certain elemental descriptors such as location, building form, and site density?

The study developed two new terms with which to understand, assess and express light availability in residential buildings. Total daylight Factor (TDF) and Overhang and Density Obstruction Factor. The Total Daylight Factor is used to assess or compare daylight availability in a dwelling unit over a year or a chosen period. For example, values of dwelling unit TDFs in the study ranged from 0.58% for a north facing apartment suite to 1.45% for a townhouse. Winter TDF values for south facing rooms are six times higher than north facing rooms. The second new term, Overhang and Density Obstruction Factor (ODOF), sums up the effect building elements and density have on light availability. Detached houses and townhouses show typically ODOFs above 80%, indicating only a modest loss in daylight attributable to exterior obstructions in their normal setting. By comparison, apartments show a factor of 50% attributable to other buildings and a 20% when the effect of balconies is added.

The analysis of typical housing examples paints an informative picture of the availability of daylight in dwelling units for the entire year and for the winter season.

This study sets the ground for a more extensive and detailed analysis of factors affecting daylight availability and levels in residential buildings. It also builds the foundation for a method to predict daylight performance of dwellings and for a means to assist building designers and planners in assessing the impact of design decisions on daylight performance.

Prepared by Enermodal Engineering Limited. CMHC Project Officer: Fanis Grammenos. Ottawa: Canada Mortgage and Housing Corporation, Research Division, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
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Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

MONTRÉAL: A GREAT TRADITION OF MEDIUM-DENSITY HOUSING

This project aims to highlight the adaptation processes of housing and building types throughout the various phases of the evolution of "plex" formulas (duplex, triplex, fourplex, fiveplex...) in Montréal over four construction cycles between 1866 and 1935.

CMHC Project Officer: Fanis Grammenos

CIDN: 1455 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: David B. Hanna, Université du Québec à Montréal
P.O. Box 8888, Station CV
Montréal, Quebec H3C 3P6

AVAILABILITY: Publication not yet available

HOUSING DESIGN

PASSIVE SOLAR TECHNIQUES FOR CANADIAN HOUSES.

This CMHC advisory document is the only authoritative Canadian reference on passive solar design. It has been updated and enhanced to include advances in systems and components and to reflect a better understanding of the design issues. Complementing this document will be a CD-ROM disk which will contain a window sizing program and a window manufacturers and product list. The advisory document will be available in May 1998.

CMHC Project Officer: Fanis Grammenos

CIDN: 1241 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INDOOR ENVIRONMENT

ASSESSMENT OF THE INDOOR AIR QUALITY OF A SUITE FOR AN ENVIRONMENTALLY HYPERSENSITIVE OCCUPANT.

This project analyzes and documents the findings of a comparative case study between an environmentally hypersensitive (EH) suite and a conventional suite in a newly constructed apartment building, located in Victoria, BC. This report documents the design and construction of the EH unit, and how it differs from a conventional unit in the same building. The indoor air quality of the EH unit was monitored and compared with that of the conventional unit and the outdoor air quality. Analysis was conducted once prior to occupancy and twice after occupancy of the units. An interview with the occupant of the EH unit was conducted to document the tenant's satisfaction and compatibility with the unit.

There was considerable effort made in designing the EH suite, and for the most part, the suite works well. Although improvements could be made in the design of the EH suite, the most significant improvements in design could be in how the suite might be incorporated in the larger design of the apartment block in order to promote integration of the occupant without compromising the occupant's health.

VOC's, formaldehyde, mold, dust and air change effectiveness were measured and compared between the EH suite and the conventional suite. The measurements showed lower formaldehyde levels and higher ventilation rates in the EH suite. The EH suite was less leaky in terms of air tightness. The results of the TVOC measurements were not definitive. Further measurements are needed to ascertain if chemical contaminants are being brought into the unit.

The EH suite at the Selkirke Apartments provides the occupant with an indoor air quality that is incrementally better than her previous accommodation. While the situation is by no means perfect for the occupant, she is coping better with her condition. If one uses the criteria of incremental improvements in order to assess the success of the EH suite, one may conclude that it is successful.

Prepared by Sheltair Scientific Ltd. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: Virginia Salares. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation,
700 Montreal Road, Ottawa, Ontario, K1A 0P7, Tel.: 613-748-2367 or 1-800-668-2642,
Fax.: 613-748-4069, Email: chic@cmhc-schl.gc.ca

CONSULTATION ON MATERIALS EMISSIONS PROJECTS

The Saskatchewan Research Council, as an outside expert, has been contracted by CMHC to evaluate the emissions-related projects being carried out by the Corporation with the intent of making recommendations for future research directions.

CMHC Project Officer: Jim White
CIDN: 1690 0300001

Division: Research Division
STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

DEVELOPMENT OF MATERIAL EMISSION TEST STANDARDS

Improved test standards for emissions from caulks and sealants and urethane foam are currently being developed. These standards, currently in draft, are now being considered within the American Society for Testing and Materials (ASTM) process. NRC/IRC has developed a draft emission test standard for VOCs from pressed wood products. Revisions are being made to these draft standards in response to an ASTM committee ballot and will be re-submitted again this year. It is anticipated that the ballot will be passed for inclusion of these standards into the ASTM process in 1998.

CMHC Project Officer: Jim White
CIDN: 1244 0201003

Division: Research Division
STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

EVALUATION OF POLLUTANT SOURCE STRENGTHS AND CONTROL STRATEGIES IN AN INNOVATIVE HIGH-RISE BUILDING

CMHC is studying the emission rate of pollutants from a number of construction and finishing materials as well as the indoor air quality and ventilation rates in several suites of the Montreal IDEAS Challenge building. The purpose of the study is to characterize the relationship between material emissions, ventilation strategies and indoor air quality in this building. The impact of occupant related sources of air pollutants will also be studied.

CMHC Project Officer: Duncan Hill
CIDN: 1557 0300001

Division: Research Division, Panel on Energy Research and Development
STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INDOOR ENVIRONMENT

EVALUATION OF THE BARRHAVEN MULTI-UNIT HOUSING PROJECT FOR THE ENVIRONMENTALLY HYPERSENSITIVE

This survey of the occupants and the landlord of a Barrhaven (Nepean, Ontario) housing project for the environmentally hypersensitive assessed whether the occupants' needs are being met and what advantages or limitations are encountered with this type of housing. For the most part, the occupants expressed satisfaction with their units. Lighting and aesthetics were considerations in addition to air quality which the occupants found very important. This study is helpful for others who are planning similar projects.

CMHC Project Officer: Virginia Salares **CIDN:** 1823 0300001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

A GUIDE TO MECHANICAL EQUIPMENT FOR CLEAN INDOOR ENVIRONMENTS

Complementing the "Building Materials for the Environmentally Hypersensitive", this publication deals with heating, ventilating, air and water purification equipment. The document is a reference guide for selecting new mechanical equipment for new construction or retrofits. The document includes discussions of the applicability of the equipment to environmentally hypersensitive individuals. The guide will be available in the fall of 1998.

CMHC Project Officer: Virginia Salares **CIDN:** 1031 0200001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

HEALTHY MATERIALS, AN INTERNATIONAL COMMUNIQUÉ ON MATERIAL EMISSIONS

This periodical, designed specifically for researchers (worldwide) on material emissions, is a communication vehicle on issues, progress, contacts and standards. It has been set-up on the Internet as a twice-yearly publication. Hard copies are also available from CMHC. Four issues are currently available, with two more expected in 1998.

CMHC Project Officer: Jim White **CIDN:** 1244 0201

Division: Research Division **STATUS:** Ongoing Project

HOUSING NEEDS OF THE ENVIRONMENTALLY HYPERSENSITIVE: SOCIO-ECONOMIC/HEALTH FACTORS: FINAL REPORT.

This study surveyed the housing needs of 200 environmentally hypersensitive individuals in Canada. The survey gathered information related to the socio-economic characteristics of this group and their current housing situation, needs and preferences. The results are used to discuss the market potential for clean air housing, the long-term social and economic implications of being afflicted with environmental hypersensitivity and program, education and research issues that would be helpful in their housing.

Prepared by Ekos Research Associates Inc. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: Virginia Salares. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

INDOOR AIR POLLUTION FROM ATTACHED GARAGES.

CMHC is contributing to a Health Canada/Environment Canada project investigating the infiltration of garage-based pollutants into houses. Twenty-five Ottawa houses have been tested to determine the leakage area between the house and the attached garage. Pressure differentials were recorded and pressure testing was repeated during the winter months. The current work includes modelling of the IAQ implications and monitoring of pollutant entry when the garage is occupied by a "calibrated" car. Data analysis and modelling are in progress during spring 1998. A report on the garage airtightness testing will be distributed by CMHC in late spring 1998.

CMHC Project Officer: Don Fugler

CIDN: 1910 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INDOOR AIR QUALITY TRAINING PROGRAM.

A program to train indoor air quality problem inspectors has been developed and piloted. The program consists of a three-day course, followed by a field training phase. Pilot testing indicated that candidates for the program should have some expertise in building science and mechanical systems. A one-day "Let's Clear the Air" seminar has also been developed for other industry interest groups. This one-day seminar is a pre-requisite to the three-day evaluators' course. Eleven trainees took the first three-day course and are going through the apprenticeship stage.

The 1998 schedule will include a new one-day field training session for building officials and public health inspectors in addition to the one-day seminars and the three-day course.

CMHC Project Officer: Virginia Salares

CIDN: 1623 0300017

Division: Research Division

STATUS: Ongoing Project

INDOOR ENVIRONMENT

INTEGRATED PEST MANAGEMENT FOR COCKROACH CONTROL IN HOUSING.

A booklet on controlling cockroaches in a safe way was developed by the City of North York Public Health Department and Metropolitan Toronto Teaching Health Unit and partly funded by CMHC. The consumer booklet teaches homeowners how to control cockroaches by using integrated pest management (IPM) methods. IPM minimizes or avoids chemical pesticides.A technical manual for property managers and public health professionals was also prepared.

CMHC Project Officer: Virginia Salares

CIDN: 1691 0301001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

THE PRINCE EDWARD ISLAND BIRTH COHORT STUDY OF MOLD IN HOMES.

This joint study between CMHC, Agriculture Canada, Health Canada and others will look at several hundred homes in Prince Edward Island to determine the biological exposure, house performance parameters and energy use characteristics of a statistically-representative set of houses occupied by newborn babies. Part of the study will follow the health of these babies to determine the degree to which damp and moldy houses result in increased infant health problems. Ongoing sampling of the house biological matter will occur in a subset of the "good" and "bad" houses. The first year of the study is underway and additional funding is being solicited for ongoing years.

CMHC Project Officer: Jim White

CIDN: 1618 0200001,
1618 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RELIABLE METHODS FOR HEAT EXCHANGER LEAKAGE TESTING

The goal of this project was to select, field test and demonstrate reliable and quantitative methods for furnace heat exchanger leakage testing. A survey was conducted on heat exchanger leakage test methods used by 40 Canadian and American utilities. This report is currently available from CMHC.

Research is also being conducted to test thirteen furnaces that had been "red-tagged" in the field. A test protocol, that was selected as being the most reliable for correctly predicting high levels of furnace heat exchanger leakage, is being used. The Canadian Gas Research Institute (CGRI), when looking into variations upon this basic test, found flaws in each test. The gas industry is unwilling to proceed with further training and implementation until they are satisfied that a more reliable test can be established. An additional test procedure is being looked at by CGRI in the spring of 1998, and will be field tested by the gas industry, if laboratory tests prove it to be accurate.

CMHC Project Officer: Don Fugler

CIDN: 1505 0200004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

SOIL GAS VOC INTRUSION RESEARCH

CMHC is contributing to a multi-agency project which is looking at the rate and predictability of volatile organic compounds (VOC) into buildings located on contaminated soils. The contractors have reviewed the available models and are collecting data at a BC test site.

CMHC Project Officer: Don Fugler **CIDN:**. 1826 0200001

Division: Research Division, External Research Program **STATUS:** Ongoing Project

Grant Recipient: Martin Adomait, President, Adomait Environmental Solutions Inc.
160 Cyprus Drive
Kitchener, Ontario, N2M 4R5

A STUDY OF HOUSE RETURN AIR SYSTEMS USING FLOOR JOIST SPACES.

Research was conducted on air in houses that is distributed through the ducting system consisting of supply ducts and a return air plenum. Floor joist spaces are being used as return plenums in new construction and this study characterizes the indoor air in a number of houses with return air plenums made of all metal, combinations of metal, solid wood, plywood or oriented strand board. A Research and Development Highlight sheet is being prepared.

CMHC Project Officer: Virginia Salares **CIDN:** 1704 0300001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

A STUDY OF RECURRING MOLD PROBLEMS ON THE ROSEAU RIVER RESERVE IN MANITOBA.

This study will survey several houses on the Roseau River Reserve, with emphasis on remediating recurring mold problems. The survey will include houses that were flooded and previously cleaned and remediated, houses that were flooded but not yet remediated and houses that were not flooded but appear to have mold and mildew problems. The study will serve as an advisory document on the technical aspects of the remediation as well as provide a database for the indoor air quality characteristics of houses that have been flooded. The work will be undertaken in the spring of 1998.

CMHC Project Officer: Virginia Salares **CIDN:** 2036 0200001

Division: Research Division **STATUS:** Planned

AVAILABILITY: Publication not yet available ***NEW***

A STUDY ON THE EFFECT OF CONTROLLING THE HOME ENVIRONMENT ON ASTHMA.

Six houses having one or more individuals suffering from asthma and in which the occupant's symptoms are linked to the house were selected for further analysis. IAQ problems in these houses were evaluated and recommendations for remediation were provided to the homeowners. Toxic molds were found in each of the six houses. Five of the homeowners proceeded with the remediation. Compliance with the recommendations varied from partial to full. Monitoring is currently being performed on the houses after the remediation. The health status of the asthmatic occupant will be followed by their physicians. This research is the first of its kind that studies the correlation between asthma and improvements to the air quality in the home.

CMHC Project Officer: Virginia Salares

CIDN: 1621 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

SUPPORT FOR THE CONSORTIUM FOR MATERIAL EMISSIONS AND INDOOR AIR QUALITY MODELLING.

CMHC is an active supporting member on the steering committee and technical committee of a consortium established by the National Research Council, Institute for Research in Construction to develop protocols for testing materials and furnishings and for modeling the impact of those emissions on indoor air quality.

CMHC Project Officer: Jim White

CIDN: 1244 0200004

Division: Research Division

STATUS: Ongoing Project

TASK FORCE ON MATERIAL EMISSIONS.

This Task Force meets twice annually to discuss issues related to chemical emissions from building materials and to help direct Canadian efforts in this field, including prioritizing future activities. During a previous meeting held in the fall of 1995, three jointly-funded projects were approved. The draft final report, "Round-Robin Testing of Volatile Organic Compounds (VOC) Emissions from Common Building Materials" has been received. The final report is expected to be be completed and available in May 1998.

The final of the paint report, "A Review of VOC Emissions and Drying Mechanisms for Interior Paints and Coatings" and the odour study, "Material Odour Emission Test Methods: Review and Evaluation" are available from CMHC's Canadian Housing Information Center. Seven additional resolutions concerning material emissions and health and future research were adopted by the Task Force during a January 1998 meeting.

CMHC Project Officer: Jim White

CIDN: 1894 0300001

Division: Research Division

STATUS: Ongoing Project

COMPARISON OF THE NATIONAL BUILDING CODE, CAN/CSA-Z240 MH AND HUD PART 3280 MOBILE HOMES.

In Canada, mobile homes are usually built to the CAN/CSA-Z240 MH standard, (Z240). The National Building Code, (NBC), forms the basis for regulating all site-built housing. In the United States, the mobile home industry operates under the Housing and Urban Development (HUD) code. The MHI of Canada (MHIC) has suggested that there may be situations where the NBC and its provincial equivalents or the Z240 standard have more stringent requirements than are required for occupant health and safety. MHIC also believes that there may be other approaches to the construction of housing that will deliver an equivalent unit of housing but at a reduced cost. CMHC, in association with MHI Canada and the Canadian Manufactured Housing Institute (CMHI), is undertaking a comparitive study of practices under the three different approaches to examine if there are non-health and safety related code/standard differences that affect production costs.

CMHC Project Officer: Doug Pollard | **CIDN:** 1939 0200001

Division: Research Division | **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available | ***NEW***

INVENTORY OF CANADIAN COMPANIES INVOLVED IN HOUSING SYSTEMS.

The purpose of this project is to develop an inventory of Canadian companies involved in housing systems, and to gather descriptive business information on those companies currently exporting housing systems.

CMHC Project Officer: Louis Musto | **CIDN:** 1771 0900001

Division: Canadian Housing Export Centre | **STATUS:** Ongoing Project

OPTIMUM VALUE ENGINEERING STUDY OF THE CANADIAN MANUFACTURED HOUSING INDUSTRY.

The Canadian Manufactured Housing Institute (CMHI), with CMHC, undertook an Optimum Value Engineering (OVE) study to examine the product engineering and manufacturing processes of the Canadian manufactured housing industry. Phase I of the project comprised literature reviews of international advances in manufactured housing, site visits to US and Canadian plants and an industry survey questionnaire. Among the important findings are the significantly expanded role for computers in the industry and the lack of use of foam adhesives in Canadian manufactured housing. Reports from Phase I can be obtained from the CMHI. Phase II began in August 1997 and undertook further studies of the potential for use of foamed adhesive to attach interior finish materials to framing, and less material-intensive floor-framing details that retain the necessary structural properties. Phase II is now complete and the final report will be available in the summer of 1998.

CMHC Project Officer: Ken Rauch | **CIDN:** 1597 0200001

Division: Research Division | **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

"RORO" MODULAR HOME SHIPPING SYSTEM.

This report discusses the potential use of RORO vessels as a shipping system for exporting modular housing components to Japan. The work looks at the modular concept, compares its costs to the more traditional panelized housing export product, estimates a potential market and discusses the system's advantage.

As one of the core elements in the report, the chapter on shipping encompasses four major sections. Section one discusses the various regulatory, industry and practical size limitations which will impact any proposed module or associated shipping system. Section two looks at various shipping options from modern containerization to traditional break-bulk cargoes. It explains the physical and operational environments one will find at the various port facilities and on the vessels themselves. The third section integrates the findings arising from the first two parts and proposes alternate methodologies and equipment for transporting modules either from plants within an hour of the port of export or from intermediate distances ranging up to 300-400 km. The final section compares the costs of shipping two identical homes to a common construction site in Japan. One home is a panelized structure and finishing materials which are loaded into two 40' containers, while the other home is a six module residence wherein the modules are equipped to be towed on their own wheel assemblies.

The report also reviews modular design as well as its technical requirements and attributes. It discusses various functional requirements, cultural attributes and some simple design options whose use can significantly improve on the somewhat boxy appearance which plagues many other modular homes. There is also an extensive discussion of technical issues such as structural anchors, inter-module connectors, joint finishing between modules, fire safety and environmental or envelope integrity. In addition, a detailed comparison is made of the differences in the costs associated with producing competing panelized and modular systems in a Canadian plant and then assembling the materials into identical homes in Japan.

Prepared by Ian Bazley. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Don Hazleden. Ottawa: CMHC, 1997 (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
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Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

VIDEO: THE FUTURE OF MANUFACTURED HOUSING: ZONING AND PLANNING ISSUES.

Manufactured housing, as an industry, has long suffered from the stereotypical view of the "trailer park" as typified in old American movies. The modern day mobile or modular home, and the typical community within which it is located are a far cry from these old trailer parks. Manufactured housing can be a very viable and affordable alternative to site-built housing. However, developers often have a problem getting planning or zoning approval for new developments. This project proposes to develop a video that shows current best practices in manufactured housing community design and the associated planning and zoning approaches that can produce desirable manufactured housing communities.

CMHC Project Officer: Doug Pollard

CIDN: 1948 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Video not yet available

B.C. MOISTURE PROBLEMS - PHASE II.

Over the past 12 months CMHC has conducted research which has been instrumental in leading an industry wide consortium in the development of solutions to technical problems associated with wood frame apartment building envelope construction in the coastal areas of BC. The first part of the program, a field survey, has now been completed and has confirmed that the problem is likely attributed to incorrect wall design and construction, leading to ingress of exterior moisture followed by inadequate drying rates. Two steering committees are being formed from the Building Envelope Research Consortium's membership. The project will involve retaining the services of consultants to test and monitor new details and wall constructions; to adapt the two currently available Best Practice Guides for wood frame building envelopes and flashings for the coastal region of British Columbia; to develop a Quality Assurance Protocol which would be specific to the wood frame industry envelope design and construction process; and to develop a training program in partnership with the CHBA and the AIBC.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816 0300006-8

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BASEMENT WALLS THAT DRY.

Research has shown that finished basement walls, with chronic wetting, produce molds dangerous to human health. This research suggests that no basement with a history of dampness should be finished until the moisture problems are completely remedied. This approach however ignores the reality that few people will spend the several thousand dollars to fix what they perceive to be inconsequential leaks. This project will attempt to find quick-drying basement wall systems, in hopes of being able to recommend these systems for marginal basements. A variety of basement insulation systems are being tested in University of Alberta test huts over the winter and spring of 1997-98. They have been subjected to a mid-wall leak and a 15 cm flood to measure the drainage and drying characteristics.

CMHC Project Officer: Don Fugler

CIDN: 1797 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BUYING A NEW HOUSE THAT WON'T GROW MOLD.

This booklet, one of a planned series, will identify the important code-related and beyond-the-code requirements, for the construction of new houses, that will resist growing mold even in moist climates and with heavy occupant loading. A 'draft' is in the final review stage.

CMHC Project Officer: Jim White

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MOISTURE & MOLD

FIELD TESTING OF MOISTURE IN STRAW BALE HOUSES.

Straw bale construction is an innovative construction technique that is gaining popularity, particularly for rural houses. While these structures seem to be working well in the dry American southwest, the birthplace of the straw bale housing movement, it is unclear how well they will withstand extended periods of cold and damp conditions. This initiative is funding three small local investigations of straw bale house moisture content: one in several houses in Alberta/BC, one in older straw bale homes in the Gatineau area north of Hull, Québec and one in several houses in Nova Scotia.

The Quebec investigation is completed and a report is available. The older straw structures were showing signs of straw rot where the straw was not adequately protected from soil-based moisture. Data is being collected from the Nova Scotia and Alberta houses and added to the information collected from other straw bale houses that are participating in an informal, international, cooperative monitoring project. The first year of testing should be complete by May 1998. Data analysis will follow.

CMHC Project Officer: Don Fugler

CIDN: 1867 0300002,
1867 0300004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: See above

GUIDANCE DOCUMENT ON RESIDENTIAL DRAIN TILE INSTALLATION AND MAINTENANCE.

The Center for Drainage Studies at McGill University, Montréal, Québec, has drafted a publication on the installation and maintenance of drain tile around the foundation perimeter of Canadian houses. McGill surveyed contractors across the country to ascertain regional patterns of drain tile installation and failure. The guide is being reviewed prior to wider distribution.

CMHC Project Officer: Don Fugler

CIDN: 1797 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

METHODS FOR THE REMOVAL OF EXCESSIVE ICE BUILD-UP ON FLAT OR SLOPED ROOFS.

This project studied safe and effective methods for de-icing flat or sloped roofs used in Montreal, especially after the freezing rain ice build-up in eastern Canada in January 1998. Salts, heating cables, plastic tents, hot water, steam, and other methods were used to remove ice from flat and sloped roofs. Generally, the most effective methods for a homeowner to use involved putting heating cables on the roof. Some of the de-icing salts were also useful. An "About Your House" factsheet for the public, based on the research findings, is currently being prepared.

CMHC Project Officer: Don Fugler

CIDN: 2025 0200003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PERFORMANCE EVALUATION OF WATER REPELLENTS FOR ABOVE GRADE MASONRY.

The objective of this project is to evaluate the performance of various water repellents for above grade masonry on a comparative basis and develop practical methods to evaluate their effectiveness. This evaluation will be based on lab analysis and field testing as well as a literature review to find available information on water repellent performance. The initial part of this study, Phase I will be conducted under the CMHC External Research Program and will examine the issue of water infiltration while Phase II will examine exfiltration.

CMHC Project Officer: Jacques Rousseau

CIDN: 1696 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PREVENTING MOISTURE AND MOLD PROBLEMS IN YOUR HOME; CONSUMER'S BROCHURE.

This handout will advise consumers what they must do to prevent future mold problems, once a clean-up (and renovation) has been performed on their home. It covers occupant habits, maintenance, keeping indoor surfaces warm, use of ventilation systems, etc.

CMHC Project Officer: Jim White

CIDN: 1030 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RAIN PENETRATION CONTROL SEMINAR.

Water penetration is a frequent, recurring problem for building owners, leading to damage of building components, interior finishes and building contents. It frequently leads to high repair costs and possible litigation. Over the past few years, research undertaken by CMHC, has contributed to the understanding and the prevention of rain penetration. In particular the pressure-equalized rainscreen has been applied and refined. In this seminar the causes of rain penetration will be examined. The results of CMHC research will be presented, along with design features and practical details, which will help prevent rain penetration in a variety of wall types. This full day seminar is targeted to architects, engineers, specifiers, builders, developers and building owners concerned about rain penetration and how to prevent it. The seminars will be presented in Toronto, Winnipeg, Edmonton, Vancouver, Montreal and Quebec City. This seminar was developed in cooperation with the Canadian Masonry Association, the Canadian Precast Concrete Institute and the Exterior Insulated Finish Systems (EIFS), curtain wall and steel manufacturers.

CMHC Project Officer: Jacques Rousseau

CIDN: 0838 0303005

Division: Research Division

STATUS: Ongoing Project

MOISTURE & MOLD

RE-INSULATION OF EXISTING FLAT-ROOF MULTI-FAMILY BUILDINGS IN QUÉBEC.

A joint project with Hydro Québec to examine ways of re-insulating low-rise multi-family buildings for energy efficiency, without causing moisture problems in the attic. Field testing was complete in early summer 1997. A final report is currently being prepared.

CMHC Project Officer: Don Fugler **CIDN:** 1377 0801001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

A RENTER'S GUIDE TO MOISTURE AND MOLD.

This four page consumers guide presents a summary of what causes mold and moisture problems, why we are concerned about mold, what humidity limitations a housing unit has, and the responsibilities of both the occupant and the landlord in cleaning up, fixing and preventing mold problems. Industry and user reviewers are currently being solicited.

CMHC Project Officer: Jim White **CIDN:** 1030 0200001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

SOLVING MOISTURE PROBLEMS IN A HOME: A RENOVATOR'S GUIDE.

This guide for renovators includes renovation solutions required in moisture troubled houses to prevent the recurrence of moisture and related mold problems. Included in the guide will be sections on water entry control, insulation, ventilation and plumbing/piping tips relevant to Canadian housing, as well as information from the draft document, "Modifying Your House So It Won't Grow Mold."

CMHC Project Officer: Jim White

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

STACHYBOTRYS CHARTARUM: CONSUMER'S BROCHURE.

This brochure will advise consumers who have a Stachybotrys chartarum problem in their house what to expect in the clean-up, as well as the remedial measures needed to prevent recurrence. It is targeted specifically to those who are also pregnant. They are advised to have the mold problem cleaned up and the house renovated, quickly and thoroughly, to prevent future mold growth and protect the health of their baby. It is being written for a committee of concerned health officials, several in the USA, who have discovered serious health effects from exposure to large amounts of this mold.

CMHC Project Officer: Jim White **CIDN:** 1367 0203

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

NORTHERN HOUSING

INNOVATIVE FOUNDATIONS, HEATING & VENTILATION.

This R&D&C (research, development, commercialization) project and first stage monitoring is complete and a report due before the end of 1998. CMHC, Yukon Housing Corporation (YHC) and Yukon Energy partnered in building two research/demonstration houses in Dawson City, Yukon. This work is a continuation of previous successes in R&D&C of the space frame foundation technology now being exported to Alaska. The thrust of the current foundation work is to reduce cost, develop a technology that can be locally manufactured and reduce the height of the crawl space.

A torque tube HSS steel section is under one house. The other house will be an extension of the sheet metal reinforced plywood monocoque technology resting on three bearing points. Lots of ground movement has been reported so the test site is proving to be a good demonstration. After a review of northern and remote technology, the heating and ventilation systems incorporate and optimize energy efficiency, minimal equipment and sustainable ventilation operation. Construction is complete and the houses are occupied. Commissioning of the project was a large task and the systems appear to be running efficiently at about half the energy consumption of a typical northern house. The mechanical technology was used on another YHC project at substantial capital savings and with some modifications appears to be the technology of choice. Work is underway to develop a more cost effective and simple foundation system.

CMHC Project Officer: Rob Duncan

CIDN: 1676 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NORTH WEB-SITE.

The purpose of this partnership project was to design, establish and maintain a dedicated NoRTH Web-Site for a two year period. The project partners are CMHC, Alaska Housing and Finance Corporation, and Yukon College. The web-site includes relevant technical information such as factsheets of research reports and the Frostline newsletter. It also includes discussion groups to provide a means of ongoing and current communication. The web-site has links to other relevant web-sites and can be visited at www.NoRTH-RTHN.org. It is scheduled to be fully operational by the summer of 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1886 0200001

Division: Research Division

STATUS: Ongoing Project

THE CANADIAN ASSOCIATION OF HOME AND PROPERTY INSPECTORS INITIATIVE.

The Canadian Association of Home and Property Inspectors (CAHPI) is a newly formed association that will represent the private home inspectors in Canada. This association is comprised of a number of national and provincial associations, including some of the major franchises, and a number of independent inspection firms. CAHPI currently represents over 600 private home inspectors, but it is anticipated that other, non-affiliated private home inspectors will increase this number in the future. Formal agreements and establishing their future requirements is currently being undertaken. A CAHPI Board has been established and they are now proceeding with setting-up and determining the responsibilities of the various committees such as, By-Laws, Accreditation and Certification, Strategic Relations, Education, Standard of Practice and Code of Ethics, and Discipline. CMHC was asked to continue with its supportive role.

CMHC Project Officer: Darrel Smith

CIDN: 1962 0200002

Division: Research Division

STATUS: Ongoing Project

NEW

THE CANADIAN RENOVATION INDUSTRY AND THE INTERNET: USAGE PATTERNS, 1998-2001.

The objective of this project is to survey renovators about their use of e-mail, web-sites, and interactive online communications.

CMHC Project Officer: Darrel Smith

CIDN: 2015 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

NEW

Grant Recipient: Donald M. Caskie
R.R.2
Paris, Ontario
N3L 3E2

AVAILABILITY: Publication not yet available

THE HEALTHY HOUSING RENOVATION PLANNER.

The purpose of this project is to develop a consumer renovation book that will focus on Healthy Housing. This book will look at the various renovation projects commonly undertaken and will provide the consumer with the information they require to plan a Healthy Housing renovation. The book is expected to be available by the fall of 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1760 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOW HEALTHY IS YOUR HOUSE: CMHC HOMEOWNER'S AND HOMEBUYER'S CHECKLIST FOR MAINTENANCE AND REPAIR.

The current CMHC's Homeowner's and Homebuyer's: Inspection Checklist for Maintenance and Repair is being revised to both update and include a Healthy Housing evaluation "tool". It will provide homeowners and homebuyers with a pre-purchase or pre-renovation guide for performing an inspection on their house. Physical condition, IAQ, energy and environmental and maintenance and repair information will be included in the document. It will be beneficial in enabling consumers to make more informed decisions prior to hiring the assistance of a private home inspector should the need arise. This advisory document will be available in the fall of 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1901 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INTEGRATING HEALTHY HOUSING AND ENERGY EFFICIENCY IN MAJOR RENOVATIONS.

Homeowners who undertake major renovations often miss the opportunities to make their houses healthier and more energy efficient. This project will target homeowners in the midst of major renovations and examine what changes would improve their designs. It will also look at where the homeowners and renovators find the information on which they base their design decisions. A pilot study of two houses is complete. The contractor is looking for ways to encourage participation by both the homeowner and the contractor, and is finding it difficult to obtain contractor involvement in the survey.

CMHC Project Officer: Don Fugler

CIDN: 1898 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RENOVATION DEMONSTRATION CASE STUDY BOOKLET.

CMHC and Natural Resources Canada in partnership with CHBA undertook a pilot Red Deer Project '94 renovation demonstration and six other similar projects in 1996/97. The Red Deer Project '94, conducted by the Red Deer Home Builders' Association, and six other projects, 5 with the local HBA's in Annapolis Valley, Ottawa-Carleton, Kitchener-Waterloo, Fraser Valley, and North Okanagan and one with APCHQ in Region de l'Estrie will be presented in a case study booklet. This publication will also include information for both homeowners and renovators on Healthy Housing, energy retrofits, and the value of using qualified renovators for their renovation work. The booklet will be available in the fall of 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1530 0300010

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RENOVATION OF GENERIC HOUSING STYLES - POST-WAR ONE-AND-A-HALF STOREY.

The objective of this project is to provide consumer information on typical approaches to the repair and renovation of post-war one-and-a-half storey houses. Criteria for these approaches will include occupant lifestyle and needs, structural and maintenance requirements, "Healthy Housing" improvements (including environmental and energy-efficiency), and the impact on home equity and resale value. A draft version is currently being reviewed by homeowners, renovators, and building scientists.

CMHC Project Officer: Don Fugler

CIDN: 1430 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RENOVATOR TRAINING IN CANADA: AN EVALUATION AND SITUATION REPORT.

Through the use of surveys, telephone conversations and focus groups, this project will evaluate the current situation with respect to renovation contractor training in Canada. A situation report will be produced to determine who else is providing training for the residential construction industry with a focus on the renovator. Other issues related to this include marketing, financing, existing materials, relationship to certification, native initiatives, and options for delivery that reach beyond current CHBA membership, (ie: community colleges, private firms, etc.). The methods of delivery will also be researched (ie. five day, correspondence, computer-based, etc.).

CMHC Project Officer: Darrel Smith

CIDN: Plan 1-0268

Division: Research Division

STATUS: Planned

AVAILABILITY: Publication not yet available

NEW

RENOVATORS AND TECHNOLOGICAL CHANGE IN THE SINGLE FAMILY OWNER-OCCUPIED HOUSING MARKET IN CANADA.

The objective of this project is to examine the dissemination of information about new technology to renovators and the utilization of the new technology in their renovations of owner occupied single family detached and semi-detached homes in Canada between the years 1990 and 2005. The technology will include that used by the major housing trades, including electrical, mechanical, carpentry, cladding, etc.

CMHC Project Officer: Darrel Smith

CIDN: 1837 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Donald M. Caskie
R.R.2
Paris, Ontario
N3R 2E2

AVAILABILITY: Publication not yet available

RENOVATION & INSPECTION

RENOVATOR'S TECHNICAL GUIDE.

This new publication is a comprehensive technical guide that will assist renovators, inspectors and the knowledgeable DIYer audiences with their renovation/energy retrofit decisions and/or advice. It follows the House as a System approach and includes current information related to residential renovation, energy retrofit and Healthy Housing. The guide focuses on why problems occur, how to avoid them and how not to create new ones as you renovate a house. It is a companion publication to the existing "Renovators Resource Guide" which focuses on the business management aspects of renovation. This publication will be available in June 1998.

CMHC Project Officer: Darrel Smith **CIDN:** 1592 0300001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

TOXIC MOLD CLEAN UP PROCEDURES: A GUIDE FOR CONTRACTORS.

This guide provides advice to renovators on how to clean up a house contaminated with toxic molds, such as Stachybotrys chartarum, including how to protect workers and occupants. A separate guide will be developed on how to renovate to prevent moisture problems (ventilation, moisture source control and surface temperature control). The first two drafts have been reviewed by public health officials (including the Center for Disease Control in Atlanta, Georgia) and selected mold and building science researchers and their comments incorporated. The format of the document is designed so that it could be used contractually by public health agencies. The document is in the final review stage.

CMHC Project Officer: Jim White

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

CMHC'S HEALTHY HOUSE IN TORONTO.

This publication provides information on CMHC's Healthy House located in Toronto. Five years ago architect Martin Liefhebber's off-grid self-sufficient house was one of two winners of Canada Mortgage and Housing Corporation's (CMHC) Healthy Housing Design Competition. The winning design met CMHC's criteria that new housing technologies and design be workable, available and affordable for the occupants and the community while going easy on the planet.

Although there are many Canadian homes that have energy and water conservation features, Liefhebber's design integrates the additional Healthy Housing principles of good indoor air quality, affordability and environmental responsibility. The four-storey, semi-detached house is located in an established neighbourhood in downtown Toronto, and because the house requires no hydro, water or sewer connections, it was possible to build on a lot that normally would be too expensive to develop.

The publication covers the thermal energy system and water treatment systems, details the design team, and describes the products used in the house construction.

Ottawa: Research Division, Canada Mortgage and Housing Corporation, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE : Aussi disponible en français sous le titre : *La maison saine de la SCHL à Toronto.*

CONSTRUCTION RESOURCE MANAGEMENT COURSE.

A private and public sector consortium has been established to develop a methodology for assisting industry to better understand, control and reduce the levels of construction, renovation and demolition (CRD) waste. To date, the partners include Industry Canada, Canada Mortgage and Housing Corporation, Alberta Environmental Protection, NWT Department of Resources, and PCL Constructors Canada Inc. Phase I will be development of a CRD training tool that will be published in a CD-ROM format and available to the consortium partners. The tool will be based upon and adapted from existing construction waste reduction courses that have been designed to clarify waste reduction issues. Phase II will consist of an Internet based CRD project management course that will: provide current resource management information and case-specific solutions; contribute to the development of standard managerial practice; promote widespread communication of the best resource recovery techniques, contribute to economic growth and job creation; promote long-term behavioural change; and help industry associations and government departments meet mandated environmental targets. The project has a planned completion date for the fall of 1998.

CMHC Project Officer: Darrel Smith

Division: Research Division

AVAILABILITY: Publication not yet available

CIDN: 2032 0200001

STATUS: Ongoing Project

NEW

DEMONSTRATION OF HEALTHY HOUSING ON RESERVE.

This project formerly reported as "Water & Sewage Disposal in Northern & Remote Locations" will now form part of the Northern Healthy House initiative. The objectives are to support the design, construction and demonstration of five on-reserve Healthy Houses in northern and southern Ontario during 1998/99. This initiative will demonstrate alternative Healthy Housing designs with features appropriate for remote communities. Features such as preferred alternatives to conventional energy, water and sewer infrastructure will be researched. Construction will commence in the spring of 1998 with the public demonstration beginning in the fall of 1998. House construction will be by locally trained trades and specialists. A CMHC report will be produced detailing house costs and benefits, designs and systems at the completion of the project.

CMHC Project Officer: Chris Ives

CIDN: 1969 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

HEALTHY HOUSING COST-BENEFIT STUDY.

The objective of this project was to identify the cost and the benefits of applying Healthy Housing principles, i.e. Occupant Health, Energy Efficiency, Resource Efficiency, Environmental Impact, and Affordability to the construction and renovation of homes. The cost benefit analysis treats the Healthy Housing features individually for the benefit of both the renovation market and for new construction. The study includes Healthy Housing capital costs and effects on the operating costs, such as reductions in energy or water consumption, and identifies the hidden benefits such as occupant health and durability of materials.

CMHC Project Officer: Darrel Smith

CIDN: 1905 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HEALTHY HOUSING SEMINAR.

A two and a half hour consumer Healthy Housing seminar, with a renovation focus, has been developed and packaged for delivery. The material was based on existing material produced by the CMHC Ontario and British Columbia Regional offices. It was also updated to include recent research and to give it a national scope. Examples of case studies were included by incorporating material from the 1994 and 1996 Renovation Demonstration projects. CMHC has entered into a partnership with the building supply industry for delivery of these seminars. Presenters will consist of both private presenters and the training staff of our retail partners. The seminars will be held across Canada, however the actual locations and timing are being negotiated with the project partners. It is anticipated that the seminars will have a limited run in some locations this spring, continue again in the fall and then run again in the spring of 1999.

A condensed 30-minute presentation of the Healthy Housing Seminar was also produced. This material can be used at home builder association meetings, various industry shows and conferences and also in the preparation of background documents.

CMHC Project Officer: Darrel Smith

CIDN: 1906 0200001

Division: Research Division

STATUS: Ongoing Project

MICROCLIMATIC OPTIMIZATION OF THE NORTHERN SUBURBS IN RELATION TO THE WIND.

The research project essentially concerns the study of wind behaviour in the suburbs at the street and parcel space levels.

CMHC Project Officer: Chris Ives, Research Division **CIDN:** 1840 0200001

AVAILABILITY: Publication not yet available **STATUS:** Ongoing Project

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MULTIFAMILY HOUSING FOR COMMUNITY SUSTAINABILITY.

This project will produce information to assist developers and municipalities in developing land at higher than current average densities by means of multiple housing forms. It will assemble and develop exemplary multiple housing solutions and assess consumer demand for these. This is a collaborative project with the Regional Municipality of Ottawa Carleton and NRCan both of which have a strong interest in community sustainability.

CMHC Project Officer: Fanis Grammenos, Research Division **CIDN:** 1628 0300001

AVAILABILITY: Publication not yet available **STATUS:** Ongoing Project

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PLANNING SUSTAINABLE COMMUNITIES.

The purpose of this project is to develop an updated advisory document on community planning and design. The updated document is intended to be a state-of-the-art report, reflecting the latest thinking in the field. The emphasis of the document will be on presenting practical examples (best practices and case studies) of innovative, sustainable and cost-effective approaches to community planning and design. It is anticipated to be available by summer 1998.

CMHC Project Officer: David D'Amour, Research Division **CIDN:** 1553 0200001

AVAILABILITY: Publication not yet available **STATUS:** Ongoing Project

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PROTOTYPE OF THE COMMUNITY SUSTAINABILITY INDICATORS SOFTWARE.

The purpose of this project is to develop and provide a working prototype of the Community Sustainability Indicators Software which will include a working demonstration of all the elements of the software concept.

CMHC Project Officer: John Engeland, Research Division **CIDN:** 1796 0200002

AVAILABILITY: Publication not yet available **STATUS:** Ongoing Project ***NEW***

STRATEGY FOR THE DEVELOPMENT, MARKETING AND DISTRIBUTING OF CONSUMER-ORIENTED PRODUCTS ON SUSTAINABLE COMMUNITY PLANNING.

To prepare a strategy for the development (i.e. content and format), marketing and distribution of consumer-oriented information products which would provide consumers with information on resource-use, costs and social implications of various community planning options in order to make decisions which benefit themselves and society.

CMHC Project Officer: Susan Fisher, Research Division **CIDN:** 1945 0200001

AVAILABILITY: Publication not yet available **STATUS:** Ongoing Project ***NEW***

SUSTAINABILITY IN PRACTICE: REDUCING CONSTRUCTION WASTE IN THE ONTARIO RESIDENTIAL CONSTRUCTION INDUSTRY.

One of the major challenges facing all advocates of sustainable development is putting theory into practice. The sound management of construction waste is one of many factors related to sustainable development that must be addressed by the housing industry. The objective of this project was to identify the most effective strategies for minimizing residential construction waste in Ontario. This involved looking at work already done on the subject, as well as interviewing several builders on their waste management practices. As a result of a collaboration between a consulting firm, Habitat Associates, and the Ontario Home Builders' Association (OHBA), regulatory mechanisms were downplayed in favour of identifying *voluntary* ways to cut waste, and earmarking ways to effectively *implement* a strategy to assist home builders with minimizing waste.

The study was conducted in two phases. Phase 1 analyzed construction waste management practices in Ontario, including waste generation rates, trends and individual reduction initiatives. Key considerations for implementing a waste reduction strategy for Ontario were identified, and in Phase 2 an implementation strategy to be led by the OHBA was developed.

Several conclusions were drawn from the first phase of the study, but two emerged as key to addressing the objectives, i.e. facilitating voluntary acceptance of waste minimizing practices and enhancing the reach and impact of the message. First, minimizing construction waste generation should be emphasized over separation and recycling. Reduction is typically the preferred of the 3Rs, but besides being the most effective way of minimizing waste, it has the potential to save money. This message is capable of attracting attention, encouraging serious consideration, and permanently changing practices. Reducing materials consumption also has a truly positive environmental impact. Secondly, builders' practices are very diverse, suggesting that there is considerable opportunity to increase awareness about waste avoidance techniques. Effectively reaching all those with a role to play in reducing waste is not easy, and therefore will require effort. Significantly reducing waste will involve improving awareness of both the general benefits of waste reduction as well as specific techniques that can reduce waste.

The second phase of the project was devoted to developing an outreach program. Based on the conclusions of Phase 1, five potential outreach strategies were formulated. Builders and others were asked to comment on the effectiveness of each alternative strategy. Based on builders' feedback and the experience and resources of the OHBA, a grassroots strategy to assist Ontario builders to reduce waste was selected. Two products were generated. The first is a kit designed to assist local Home Builders' Associations (HBAs) with initiating a local campaign or event to raise awareness of the benefits of waste reduction. The second document provides details that can be used as background information by those hosting an event, and can also be used directly by home builders. It contains practical information, testimonials and cost-saving data.

Prepared by Teresa Paul, Habitat Associates with the Ontario Home Builders' Association. CMHC Project Officer: Terry Marshall. Ottawa: Canada Mortgage and Housing Corporation, 1997 (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

SUSTAINABLE LANDSCAPE DESIGN FOR RESIDENTIAL DEVELOPMENTS.

The objective of this project is to highlight the link between sustainable development for housing with the condition, composition and use of native vegetation.

CMHC Project Officer: Susan Fisher **CIDN:** 1466 0200001

Division: Research Division, External Research Program **STATUS:** Ongoing Project

Grant Recipient: Karen Vagelatos, Vagelatos Associates Landscape Architecture Ltd.
207-2211 West 4th Avenue
Vancouver, British Columbia, V6K 4S2

AVAILABILITY: Publication not yet available

VISUALIZING SUSTAINABILITY: ANALYZING PREFERENCES FOR SUSTAINABLE COMMUNITY DESIGN.

The scope of this research is to provide a visual forum for the exploration of sustainable community design on the Internet. The purposes of the forum are to educate the public and to provide a vehicle for the free and open exchange of ideas.

CMHC Project Officer: Fanis Grammenos **CIDN:** 1640 0200001

Division: Research Division, External Research Program **STATUS:** Ongoing Project

Grant Recipient: Professor Richard Perron, Department of Landscape Architecture
University of Manitoba
Winnipeg, Manitoba, R3T 2N2

TREE CARE

TIPS FOR POST-STORM TREE CARE.

This fact sheet on post-storm tree care was prepared in response to the recent ice storm in Eastern Ontario and Quebec. Tips are provided on how to clean up broken branches and remove torn bark, how to maintain tree vigour, and how to hire a contractor. Sources of further information are included.

About Your House Fact Sheet; CE 12. Ottawa: Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE : Aussi disponible en français sous le titre : *Le soin des arbres après la tempête*.

APPLICATION FOR SHOWER WASTE WATER HEAT RECOVERY.

The purpose of this project is to test the performance of a heat recovery shower product.

CMHC Project Officer: Chris Ives **CIDN:** 1500 0200001

Division: Research Division, Housing Technology Incentives Program **STATUS:** Ongoing Project

Grant Recipient: Heat Exchangers NF Incorporated
26 Georgia Drive
Stephenville, Newfoundland, A2N 2T5

AVAILABILITY: Publication not yet available

DISCUSSION PAPER ON WATER REUSE - NEEDS, TRENDS AND CASE STUDIES.

This project will serve as a basis for discussion with agencies involved with water infrastructure, research groups, potential manufacturers of water technologies, and the general public. The research will identify water technologies, discuss performance through case studies, and highlight areas in Canada that are in need of such technologies.

CMHC Project Officer: Cate Soroczan **CIDN:** 1927 0200003-4

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

GREYWATER TECHNOLOGY SOFTWARE DEVELOPMENT.

CMHC is participating in this research project to further develop theTECHSPEX software package to address water use, reuse and treatment. This product will provide a number of technical solutions to onsite or small community water treatment requirements based on user needs. Costs for the items specified and product availability are also included in the software development.

CMHC Project Officer: Cate Soroczan **CIDN:** 1927 0200005

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

INNOVATIVE ON-SITE WASTEWATER TREATMENT.

This project is studying the impact of residential water conservation and on-site wastewater management on groundwater quality. In particular, it addresses the issue of nitrates in groundwater. The test site is a new, occupied rental unit which contains code-approved water-conserving fixtures coupled to a novel on-site wastewater treatment system. A monitoring program is in place to determine the impact of the reduced waterflow on the baseline ground water quality. The initial loading conditions for this single house system have been adequately demonstrated and some changes have been made to the installation to increase the recycling level of effluent to the Biofilter. The final report is currently in the review stage with an anticipated completion date in early summer 1998.

CMHC Project Officer: Chris Ives

CIDN: 1047 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INNOVATIVE RESIDENTIAL WATER AND WASTEWATER TECHNOLOGIES.

The purpose of this project is to identify and describe applications and research on innovative technologies for residential water supply and wastewater treatment.

CMHC Project Officer: Peter Russell

CIDN: 1832 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

A NEW PROCEDURE FOR EVALUATING THE PERFORMANCE OF ON-SITE SYSTEMS.

To assess the value of the "Leachfield Evaluation Test", claimed to be successfully used by agencies in California. This is a method for assessing the hydraulic performance of an onsite sewage disposal system.

CMHC Project Officer: Chris Ives

CIDN: 1289 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: D.H. Waller, Technical University of Nova Scotia
Centre for Water Resources Studies
1360 Barrington Street, P.O. Box 1000
Halifax, Nova Scotia, B3J 2X4

AVAILABILITY: Publication not yet available

ONSITE RECYCLED WATER QUALITY MONITORING.

This project will identify the available water quality monitoring technologies appropriate for on-site and small community reuse and treatment systems. The study will also examine issues of merit, cost of implementation and operational factors.

CMHC Project Officer: Cate Soroczan **CIDN:** 1936 0200

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

REGULATORY BARRIERS TO ON-SITE WATER REUSE.

This report represents the results of an investigation into the existence of regulatory barriers to the implementation of on-site water reuse in Canada. The report explores the barriers which are present in health and environmental regulations, as well as in plumbing/building codes and municipal by-laws. Regulatory barriers are outlined at the national level and within each province or territory, with municipal examples provided.

The results of the report indicate that the most significant barrier to the implementation of on-site water reuse may be the lack of regulations and guidance across the country. Proponents indicated that guidance within provisions of the Plumbing Code would facilitate the acceptance of on-site reuse technology within their jurisdictions. In particular, documented proof of the safety of on-site systems with regard to public health would be of great benefit. No absolute regulatory barriers to on-site water reuse could be identified. Obstacles are instead created largely by attitudes and perception. The solution may lie in creating a Code of Good Practice and documenting case studies in order to provide guidance and confidence to decision-makers.

Prepared by Canadian Water and Wastewater Association. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Cate Soroczan. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642, Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE : Aussi disponible en français sous le titre : *Obstacles posés par la réglementation à la réutilisation de l'eau locale.*

REPORT ON WATER AND WASTE WORKSHOP.

Provide a detailed report on a Workshop held at CMHC Oct. 22 on "Accelerating the Implementation of Innovative Water and Wastewater Treatment Management and Technology".

CMHC Project Officer: Peter Russell **CIDN:** 1757 0300002

Division: Research Division **STATUS:** Ongoing Project

Grant Recipient: Mr. Allan Townshend
R.R.# 1
Athens, Ontario, K0E 1B0

WATER CONSERVATION, REUSE & MANAGEMENT

THE SUSTAINABLE HOME WATER SYSTEM.

The objective of this research is to develop a system which will collect rain water for non-potable uses in a house plus a grey water heat recovery and recycling system.

CMHC Project Officer: Peter Russell **CIDN:** 1224 0200001

Division: Research Division, Housing Technology Incentives Program **STATUS:** Ongoing Project

Grant Recipient: A.C.E. Alternative and Conservation Energies Inc.
1909-10th Avenue S.W.
Calgary, Alberta, T3C 0K3

AVAILABILITY: Publication not yet available

WATER RECYCLING DEMONSTRATION.

Research and development of greywater reuse is being undertaken in the Conservation Co-op apartment building in Ottawa. A facility in the basement filters and disinfects shower and bath water from 8 units which is reused as toilet flushing water. Initial design and component shortcomings have been corrected and the system is operational with hand-over to the building owners anticipated at the end of 1998. Plant performance and water quality are being measured with a report anticipated towards the end of 1998.

CMHC Project Officer: Peter Russell **CIDN:** 1573 02010003,
1573 0200001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

WATER RECYCLING DEMONSTRATION AT THE QUAYSIDE VILLAGE COHOUSING DEVELOPMENT IN NORTH VANCOUVER.

The objective of this project is to demonstrate a water reclamation system suitable for installation in Quayside Village. The installation will be designed to collect water discharged from the bath, sinks and showers in the 19 units for re-use as toilet flushing and shower use in the same units.

CMHC Project Officer: Cate Soroczan **CIDN:** 1991 0200001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available *** NEW ***

WATER CONSERVATION, REUSE & MANAGEMENT

WATERSAVE : RESIDENTIAL WATER USE MODEL.

A user-friendly computer model was developed that determines daily water consumption for a prescribed pattern of water use in a house. It also incorporates facilities to treat and reuse grey water. The program will be of value to designers of innovative residential plumbing systems. Its first applications were for the design of the water system for the CMHC Toronto Healthy House and the Conservation Co-op apartment building in Ottawa (see "Water Recycling Demonstration"). Version I will be released by summer 1998.

CMHC Project Officer: Peter Russell

CIDN: 1422 0200002,
1422 0800001

Division: Research Division, Panel on Energy Research & Development

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SOCIAL AND ECONOMIC RESEARCH

BRINGING THE HABITAT AGENDA HOME.

The purpose of this project is to publish a book to inform the membership and others in the Canadian Habitat NGO network about the outcome of the Habitat II Conference and the Habitat Agenda, as well as to provide information and ideas in order to facilitate the implementation of the Habitat Agenda.

CMHC Project Officer: Louis Musto

CIDN: 1965 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

EVALUATION OF THE *ÉCO-QUARTIERS* PROGRAM.

The purpose of this project is to evaluate Montréal's *Éco-quartiers* program with regard to the management of the urban environment and the improvement of the living environment.

CMHC Project Officer: Susan Fisher

CIDN: 2001 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

NEW

Grant Recipient: Gilles Sénécal, INRS-Urbanisation
3465 Durocher Street
Montréal, Quebec H2X 2C6

AVAILABILITY: Publication not yet available

CONTAMINATED LANDS

URBAN BROWNFIELDS: CASE STUDIES FOR SUSTAINABLE ECONOMIC DEVELOPMENT: THE CANADIAN EXAMPLE.

This paper is part of the contribution of CMHC to an ongoing collaborative initiative of the Organization for Economic Cooperation and Development (OECD), the United States Environmental Protection Agency (U.S. EPA), and the International City and County Managers Association (ICMA). The report provides information on the current Canadian situation regarding legal and administrative frameworks, players in the process of developing contaminated sites, recent case studies, and suggested best practices that might be employed in other jurisdictions.

Challenges to development on contaminated sites are grouped into six issue groups: regulatory, technical/scientific, legal/liability, financial, urban planning, and communications. By far the most prominent issue is the desire of all participants in the development process to reduce or eliminate their exposure to liability to pay for site cleanup or the effects of contamination. A significant issue is the added time and expense that is required to develop contaminated sites that may result from approval processes, and regulations which call for unnecessary or unrealistic cleanup activities. The inability to gain financing and insurance for redevelopment projects is a significant barrier. There are opportunities for a better integration of land use planning and site remediation disciplines and their respective approval processes. Methods to better communicate the issues surrounding contaminated sites are needed to reduce fears and misconceptions among process participants and observers alike.

To address the many issues common to redeveloping contaminated sites, twenty-two best practices are suggested. The single most important best practice is the risk assessment/risk management (RA/RM) approach. This method evaluates the actual human or environmental risk, considering the nature of contaminants in relation to the sensitivity of receptors and the exposure pathways, and is favoured by many practitioners.

Prepared by Delcan Corporation, Golder Associates Ltd., and McCarthy-Tétrault. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: David D'Amour. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

COOPERATIVE AND NON-PROFIT HOUSING

MEMBER INTEGRATION - MANAGEMENT PRACTICES IN HOUSING COOPERATIVES

The research project aims to study the integration and housing processes within the management practices in cooperative housing environments.

CMHC Project Officer: Glynis Kossatz

CIDN: 1451 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Marie J. Bouchard
Université du Québec à Montréal
P.O. Box 6192, Station CV
Montréal, Quebec H3C 4R2

AVAILABILITY: Publication not yet available

DISCRIMINATION IN HOUSING

HOUSING AND DISCRIMINATION: A REVIEW OF CURRENT KNOWLEDGE.

The objective of this research is to identify and examine what knowledge and expertise regarding housing-related discrimination is available in or applicable to Canada.

CMHC Project Officer: Teresa Van Den Boogaard

CIDN: 1792 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

HOUSING AND DISCRIMINATION: THE LEGAL FRAMEWORK.

The purpose of this project is to examine housing-related discrimination from a legal perspective to understand how housing-related discrimination fits in Canada's legal framework.

CMHC Project Officer: Teresa Van Den Boogaard

CIDN: 1793 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOME OWNERSHIP

HOMEBUYING STEP BY STEP: A CONSUMER GUIDE AND WORKBOOK.

This hands-on workbook provides users with everything they need to purchase a home. It covers all the steps in the process, from assessing housing needs to arranging a mortgage and closing the deal. Checklists and worksheets are provided to help in assembling the right information and make the right decisions and a glossary of homebuying terms is included.

Ottawa: Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642, Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

IDENTIFYING THE IMPEDIMENTS TO BUYING A HOUSE.

The purpose of this project is to conduct a survey of people searching for houses in order to improve understanding of home buyer behaviour. The survey will ask questions about the duration of time already spent searching; the number of houses inspected without selecting one of them; ... etc.

CMHC Project Officer: David Dallaire

CIDN: 1650 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Dr. Paul Anglin, Associate Professor
University of Windsor, Department of Economics
401 Sunset Avenue
Windsor, Ontario, N9B 3P4

AVAILABILITY: Publication not yet available

METHODS USED ABROAD TO SUPPORT ACCESS TO HOME OWNERSHIP.

The objective of this research is to investigate significant and novel mechanisms which other nations have employed, encouraged and/or are considering that support and facilitate access to home ownership in general or to target populations.

CMHC Project Officer: David Metzak

CIDN: 1931 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

HOMELESSNESS

THE BEST PRACTICES FORUM ADDRESSING HOMELESSNESS.

The objective is to prepare a forum structure and implementation plan for the Best Practices Forum Addressing Homelessness.

CMHC Project Officer: Brenda Baxter **CIDN:** 1958 0200001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available *NEW*

HOUSING

LINKS BETWEEN HOUSING AND THE HEALTH OF THE POPULATION.

The objective of this project is to study the links between housing and population health.

CMHC Project Officer: Phil Deacon **CIDN:** 1926 0200001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available *NEW*

RESIDENTIAL PROJECTS AND ROAD SAFETY.

To make an inventory of the proposed residential development principles in view of ensuring the safety of the different road users and the quality of life of the residents.

CMHC Project Officer: Leigh Howell **CIDN:** 0925 0200001

Division: Research Division, External Research Program **STATUS:** Ongoing Project

Grant Recipient: Denise Piché, Université Laval, School of Architecture
Québec, Québec G1K 7P4

AVAILABILITY: Publication not yet available

HOUSING

"WHO DOES WHAT" IN THE CANADIAN HOUSING SYSTEM.

The objective of this project is to identify the roles and responsibilities of the three levels of government with respect to housing.

CMHC Project Officer: Jamie Angus **CIDN:** 1895 0200002

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING AFFORDABILITY

"AFFORDABLE PROJECT OF THE MONTH" WEB PAGE.

This project will determine the feasibility, content and method of maintaining a monthly page on the CMHC web site that portrays successful, affordable housing projects. It will examine the interests of the development community with regard to information on affordability, generate a structure and format that responds to these needs and create an initial database of appropriate projects that could be posted. The Web page is expected to be operational by mid 1998.

CMHC Project Officer: Fanis Grammenos **CIDN:** 1878 0200001

Division: Research Division **STATUS:** Ongoing Project

AFFORDABLE, VERSATILE HOUSING.

This project will identify and describe house designs that enable a house to accommodate a range of housing types, sizes and needs by means of their adaptability. It will document the features of designs that have been built and it will explain their economic and use advantages. The set of designs to be included will cover all housing forms, from detached houses to apartments. This first guide on adaptable designs will be made available both in hard copy and electronic format via the Internet. The final report will be available in August 1998.

CMHC Project Officer: Fanis Grammenos **CIDN:** 1783 0300001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

BLENDED INCOME HOUSING: LITERATURE REVIEW AND ANALYSIS.

The purpose of this project is to provide a summary of the range of housing, social and economic issues and thinking on income blended housing projects and the evolution of experiences within it.

CMHC Project Officer: David Scherlowski

CIDN: 1925 0200001

iDivision: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

MARKET ANALYSIS AFFORDABILITY SOFTWARE PROJECT.

The objective of this project is to make modifications to Affordability to keep the software current with the latest technology; provide customization for interested clients/partners; create a fully functional Internet version should it be feasible; and provide technical support and expertise to help solve issues and problems that cannot be resolved by CMHC's help desk.

CMHC Project Officer: Greg Goy

CIDN: 1536 1000002

iDivision: Market Analysis Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

NEW WAYS TO CREATE AFFORDABLE HOUSING: RESULTS OF A NATIONAL SURVEY OF HOUSING PROVIDERS - FINAL REPORT

The Canadian Housing and Renewal Association (CHRA) and Canada Mortgage and Housing Corporation (CMHC) entered into a partnership arrangement in 1997 to investigate activities being undertaken by the non-profit, municipal and co-operative housing sector to develop affordable housing without traditional government housing supply programs. A survey was undertaken to identify:

- the level of interest, capacity and willingness of these groups to develop affordable housing;
- innovative approaches that have been used, attempted or considered;
- tools, mechanisms and information that may be needed to implement innovative approaches; and
- interest in creating a system to facilitate the ongoing sharing of information on "best practices" and the preferred format and medium.

A total of 186 organizations responded to the survey. Most of the respondents were traditional housing providers, community based non-profit housing groups, other non-profits and municipal non-profit groups. Although not a random survey, and therefore not representative of the entire population of housing organizations, the results are indicative of the nature of current affordable housing activity across the country, and do provide insights into the views of housing providers on a range of relevant issues.

Prepared by Deborah Kraus and Margaret Eberle. Sponsored by the Canadian Housing and Renewal Association and Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

PREPARATION OF A GUIDE TO HOUSING PARTNERSHIPS.

The purpose of this project is to prepare the substantive content of a guide to creating housing partnerships in Canada.

CMHC Project Officer: Jamie Angus

CIDN: 1874 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING AFFORDABILITY

THE PROVISION OF AFFORDABLE HOUSING IN THE UNITED STATES THROUGH PUBLIC-PRIVATE PARTNERSHIPS (PPPs)

The objective of this project is to prepare a report outlining how the US has developed and evolved an apparent "system-wide" approach to encouraging and supporting the provision of affordable housing through PPPs and to assess whether there are opportunities to either adopt and/or adapt similar types of measures in Canada.

CMHC Project Officer: David Metzak

CIDN: 1790 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SHELTER AFFORDABILITY AND HOUSING NEEDS OF CANADIAN FOOD BANK CLIENTS

The purpose of this research is to encourage an exchange of information on the substantive aspects of the project, Shelter Affordability and Housing Needs of Canadian Food Bank Clients.

CMHC Project Officer: John Engeland

CIDN: 1099 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Jeff A. Sloan, c/o Associate Professor, University of Manitoba
Nursing Research Institute, Faculty of Nursing
Winnipeg, Manitoba, R3T 2N2

AVAILABILITY: Publication not yet available

A COMPARATIVE STUDY OF IMMIGRANT HOUSING, NEIGHBOURHOODS AND SOCIAL NETWORKS IN TORONTO AND MONTREAL.

This study examines the relationships that exist between housing, neighbourhoods and social networks among visible minority immigrants living in metropolitan Toronto and Montreal. The importance of comparative research between cities and immigrant groups in order to dismantle the ideas of a singular "immigrant experience" is emphasized, as is the importance of intra-urban housing and neighbourhood-based processes within our largest cities in understanding the nature of settlement. The study focuses on Jamaican, Central American and Vietnamese immigrants living in Toronto, and the same groups, substituting Haitians for Jamaican immigrants, in Montréal. The objectives of the study are five-fold: 1) to examine where individual immigrant groups live in Toronto and Montreal and their degree of segregation; 2) to survey differences in housing conditions (tenure, dwelling type, cost, quality) between visible minority groups and to investigate factors which may account for such differentials; 3) to test the hypothesis that vertical immigrant enclaves in high-and low-rise buildings are replacing older inner city neighbourhoods as reception areas for immigrants; 4) to compare and contrast the housing experiences, residential satisfaction, perceptions of the city and neighbourhoods, and types of neighbouring between different immigrant groups; and 5) to probe the development of community through an examination of the ways in which immigrants have developed, use and gain support from social networks of kin and friends. The study draws upon two data sources: the 1991 Canadian census and a questionnaire survey of 173 individuals. Among the study's major findings are: significant suburbanization of some immigrant groups in a variety of styles of housing with important variations between the two cities; somewhat poorer housing conditions for immigrants relative to British/French Canadians and that these differences in status are not simply a function of time of arrival, household income or family type; generally strong levels of satisfaction with housing and neighbourhoods among individuals in both cities; and the critical roles played by friends and family in facilitating post-arrival settlement over a period of years.

Prepared by Brian K. Ray. CMHC Project Officer: Roger Lewis. Ottawa: Canada Mortgage and Housing Corporation, 1998. (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642, Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

GUIDE TO CANADIAN HOUSING FOR IMMIGRANTS.

The purpose of this project is to produce a guide that would assist immigrants in understanding Canadian housing and housing systems.

CMHC Project Officer: Jamie Angus

CIDN: 1802 0200001

Division: Research Division

STATUS: Ongoing Project

Grant Recipient: Mr. Tom Zizys, Ph. D.
56 Blantyre Avenue, Scarborough, Ontario, M1N 2R4

AVAILABILITY: Publication not yet available

HOUSING EXPORT OPPORTUNITIES

ADAPTING CANADIAN HOUSING TO INTERNATIONAL MARKET REQUIREMENTS.

The objectives of this project are to develop a qualitative and quantitative presentation on the extent of off-the-shelf versus adapted offerings of industry at present; develop a sector-by-sector picture of the feasibility of adaptation, based on considerations to be taken into account in each, and on specific case studies; and, develop a ranked list of practical steps which can be taken by Canadian industry to adapt to foreign customer requirements and expectations.

CMHC Project Officer: Rob Duncan

CIDN: 2008 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: David Crenna
82 Bayswater Avenue
Ottawa, Ontario, K1Y 2E9

AVAILABILITY: Publication not yet available

NEW

CANADIAN/JAPANESE CONSTRUCTION COST ANALYSIS OF A TYPICAL 2X4 FRAMED HOUSE PLAN.

The purpose of this project is to develop a costing spreadsheet tool for use on all soft and hard costs forming part of the delivered turn key project including at minimum, design; permits and approvals; materials; etc.

CMHC Project Officer: Jay Thakar

CIDN: 1596 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CODES AND STANDARDS PROPOSAL TO GERMANY.

The objective is to develop and implement a strategy and action plan for a proposal to be made to German authorities to improve access to the German housing market for the Canadian Housing System.

CMHC Project Officer: Terry Robinson

CIDN: 1809 0900001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CRITERIA TO HELP FORGE SUCCESSFUL CANADIAN HOUSING ALLIANCES.

The purpose of this project is to develop and validate criteria to help determine what makes alliances successful in the housing export market.

CMHC Project Officer: Louis Musto **CIDN:** 1770 0900001

Division: Canadian Housing Export Centre **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

DIRECTORY OF SOURCES OF SUPPORT FOR CANADA'S HOUSING EXPORTERS. THIRD EDITION.

The purpose of this directory is to summarize federal, provincial and other Canadian programs and services currently available to support the international commercial endeavours of Canada's housing industry.

Most of the resources identified are provided through federal departments and agencies and are related mainly to such areas as export promotion, financing, preparedness, training, market research, insurance and the provision of market intelligence and data. Additional export resources include those provided by provincial agencies responsible for export promotion and expansion, the international trade expertise that resides in Canada's academic community, in private or non-profit sector organizations focused on expanding Canadian exports, and non-governmental trade organizations.

Ottawa: Canadian Housing Export Centre, Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE : Aussi disponible en français sous le titre : *Répertoire des sources offrant un soutien aux exportateurs canadiens du secteur de l'habitation.*

EXPANDING THE KOREAN MARKET FOR RESIDENTIAL WOOD-FRAME CONSTRUCTION: FINAL REPORT.

This report summarizes a study of regulatory and other impediments to the potential expansion of the South Korean market for Canadian-style wood-frame construction for multiple unit residential buildings. The overall goal of the study was to identify means of eventually increasing sales of Canadian wood-frame residential construction materials, equipment and professional services in South Korea.

The authors provide an overview of the housing market and summarize South Korean building code requirements which affect multiple unit residential construction and limit the use of wood structures. They discuss the activities of the South Korean housing industry in respect of wood-frame construction, as well as perceptions of a variety of South Korean sources regarding the possible expansion of the wood-frame construction market. Strategic considerations respecting this potential expansion of market are also identified.

Prepared by Larden Muniak Consulting Inc. in association with Sang-Man Youn Architect. CMHC Project Officer: Jay Thakar. Ottawa: Canada Mortgage and Housing Corporation, Canadian Housing Export Centre 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

EXPORT HOME SEISMIC SLAB FOUNDATION.

The purpose of this project is to identify and develop a new seismic resistive foundation system for use in Japan, which could be "packaged" with Canada's housing technology and exports to create a value-added and thus more attractive export housing product.

CMHC Project Officer: Rob Duncan

CIDN: 2019 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

NEW

Grant Recipient: Ian B. Bazley
32 Bello Road
Kelowna, British Columbia V1V 1C1

AVAILABILITY: Publication not yet available

EXPORTER WORKSHOP FOR CANADA'S HOUSING INDUSTRY.

Prepare and deliver a series of workshops aimed at providing hands-on training for housing industry small and medium enterprise principals who want to begin exporting or would like to improve their export related knowledge and basic exporting skills.

CMHC Project Officer: Louis Musto

CIDN: 1768 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INTERNATIONAL COMPETITION IN CHINA'S HOUSING MARKET.

Provide Canadian housing companies with up-to-date knowledge of the types of housing and prices offered by foreign competitors in China's housing market.

CMHC Project Officer: Jay Thakar

CIDN: 1772 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INTERNATIONALIZATION OF CANADIAN HOUSING SECTOR BUSINESSES: A PERCEPTUAL ANALYSIS

The objective of this project is to conduct directed interviews with forty business executives throughout the country, working in three sub-sectors of the housing industry: professional construction services, housing manufacturers and product and material makers.

CMHC Project Officer: Joanne Hallée

CIDN: 1999 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

NEW

Grant Recipient: François Cadotte, FC Recherche
2238 Belgrave Avenue
Montreal, Québec H4A 2L8

AVAILABILITY: Publication not yet available

HOUSING EXPORT OPPORTUNITIES

RETROFITTING RUSSIA'S HOUSING STOCK: OPPORTUNITIES AND OBSTACLES FOR CANADIAN EXPORTERS.

To identify several basic business development strategies which could be employed by Canadian firms to practically and realistically respond to the market opportunities represented by the Russian housing sector.

CMHC Project Officer: Oliver Drerup

CIDN: 1830 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Green Catalyst Group Inc.
153 Huron Street
Toronto, Ontario, M5T 2B6

AVAILABILITY: Publication not yet available

SECONDARY RESEARCH ON THE CANADIAN HOUSING INDUSTRY.

The purpose of this project is to construct profiles of selected sub-sectors that comprise the Canadian Housing Export Centre's major target client base.

CMHC Project Officer: Louis Musto

CIDN: 2035 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

EMPLOYMENT AND HOUSING ACTIVITY: A CYCLICAL ANALYSIS.

The objective of this project is to review the economic literature, prepare an estimation strategy, analyze the past cycles of retained employment indicators and estimate the elasticities of housing starts and MLS sales in relation to the employment indicators.

CMHC Project Officer: Louis Trottier

CIDN: 1952 1000002

Division: Market Analysis Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

MACROECONOMIC IMPACTS OF THE HOUSING SECTOR.

This study presents a series of simulations investigating the macroeconomic impacts of a two-year, temporary increase in housing construction activity. The simulations were conducted with the FOCUS macroeconometric model, built and maintained at the Institute for Policy Analysis, University of Toronto.

The central section of the study presents simulation results for 16 separate simulations. These simulations consider all the possible combinations of four basic two-way choices or assumptions: new construction versus alterations, high versus low growth in the underlying economy, historically observed versus observed-times-two import propensities in the construction sector, and monetary policy aimed at stabilizing interest rates versus monetary policy aimed at stabilizing exchange rates.

The simulations show that a temporary increase in housing activity can have important induced effects on the economy, and that stimulus of this sort could be used as a tool of countercyclical policy during a slump or recession. Stimulus takes up to a year to gather momentum and can persist for a year or more after the stimulus is removed. The simulations also indicate that a temporary housing stimulus of this kind develops its own contractionary aftershock within 3 to 4 years (or somewhat longer under interest-rate targeting).

The simulations indicate small differences in impacts when new construction is compared to alterations. Doubling import propensities in construction naturally scales down the expansionary impact of construction activity, since expenditure leakages in the form of imported building materials are greater. The choice of interest rate and exchange rate control has little effect on the short-term impacts of the cases, but do produce more pronounced differences over the longer term. Assumptions about the state of the economy have little impact on the simulation results.

Prepared by Informetrica Limited. Analysis and Simulations: Geoff Bromfield; Report: Carl Sonnen. CMHC Project Officer: Orlando Manti. Prepared for Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642, Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

HOUSING POLICY

SUMMARY OF THE 1998-2002 CORPORATE PLAN = RÉSUMÉ DU PLAN D'ENTREPRISE POUR 1998-2002.

This document provides a summary of Canada Mortgage and Housing Corporation's (CMHC) Corporate Plan for the 1998-2002 period and the Corporation's 1998 annual budgets which were approved by the Treasury Board and the Governor in Council in December 1997. This summary, a requirement under the *Financial Administration Act (FAA)*, is tabled each year in Parliament.

The Corporate Plan Summary identifies key issues that will impact on CMHC's business directions over the next five years, the overall objectives for the planning period, the strategies and associated activities that CMHC will use to achieve its objectives, and the performance measures for the strategies. The document also sets out a plan for the financial resources that CMHC will require to carry out federal housing policy for the next five years.

Ottawa: Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
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Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

FEASIBILITY STUDY FOR A SURVEY OF CONSUMER INTENTIONS TO BUY OR RENOVATE.

Canada Mortgage and Housing Corporation (CMHC) client surveys have identified the need to increase the quality and timeliness of information about the intentions to purchase a home or to undertake renovations. A consumer intentions survey could provide CMHC and its clientele with a short-term indicator of local housing activity, and give important insights into the following questions:

- Are there differences between the purchase intentions of first-time and repeat buyers?
- What size of home are purchasers looking for? How much are they looking to spend?
- Why are people choosing to buy or renovate? Why are people *not* choosing to buy or renovate? Are decisions related to the economic conditions, or lifestyle choices and preferences?

This research looks at the feasibility and cost for a survey instrument that addresses these key issues and objectives.

The study involved two components: 1) an analysis of the literature on the relationships among consumer intentions, confidence, and purchase activity, and 2) the design and pre-test of a questionnaire as the basis for determining the feasibility of a program to track consumer intentions with respect to housing. The literature review provided the theoretical and conceptual context for the pre-test instrument; the pre-test itself provided information about the costs and effectiveness of the proposed instrument.

After reviewing a series of methodological options, the authors conclude that a telephone survey represents the most cost effective way for CMHC to undertake a study of housing intentions. The methodology is akin to that used in the University of Michigan Survey Research Centre on its Index of Consumer Sentiment. They have proposed a sample questionnaire (Appendix A) that has already been pre-tested for question phrasing and flow. The questionnaire collects a range of information about respondents' housing intentions and the reasons for these intentions.

Large sample sizes will be needed to generate statistically valid information for the sample groups that CMHC has identified. This raises the cost of the study accordingly. However, the quality of information generated is also much improved. Factors such as the precision, frequency, and resolution of the survey must be weighed in determining business feasibility.

Prepared by Prairie Research Associates. Prepared for Market Analysis Centre, Canada Mortgage and Housing Corporation. CMHC Project Managers: Greg Goy, Terry Petherick, Tim Gross, Ali Manouchehri. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road,Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE : Aussi disponible en français sous le titre : *Étude de faisabilité pour une enquête sur les intentions d'achat ou de rénovation des consommateurs.*

HOUSING SURVEYS

REVIEW OF DATA SOURCES AND INDICATORS.

The purpose of this project is to undertake a review of the major national data sources that include housing information which will assist in examining the role each might play in monitoring housing and community trends and developing related indicators.

CMHC Project Officer: Roger Lewis **CIDN:** 1988 0200001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available *NEW*

SEASONAL ADJUSTMENT OF HOUSING STARTS TIME SERIES.

The objective of this project is to introduce reliable estimates of seasonally adjusted series at the beginning of the new year, at the time when all other CMHC survey data are revised and updated.

CMHC Project Officer: Michel Laurence **CIDN:** 1967 1000002

Division: Market Analysis Centre **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available *NEW*

INFRASTRUCTURE

PRIVATIZATION OF MUNICIPAL INFRASTRUCTURE, ANALYZING THE COSTS AND BENEFITS.

The objective of this research is to conduct a comprehensive literature review to obtain an understanding of the past and present privatization efforts and issues.

CMHC Project Officer: David D'Amour **CIDN:** 1788 0200001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

INFRASTRUCTURE

THE PROVISION OF MUNICIPAL INFRASTRUCTURE THROUGH DEMAND MANAGEMENT.

The purpose of this project is to prepare a guide or advisory document on demand management strategies for municipal water and wastewater services.

CMHC Project Officer: David D'Amour

CIDN: 1916 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MORTGAGES AND HOUSING FINANCE

FEASIBILITY STUDY ON THE COMMERCIAL VIABILITY OF LAND-ONLY MORTGAGE LOAN INSURANCE.

To enable CMHC to better assess the potential demand for land-only mortgage loan insurance, the risks associated with offering land-only mortgage loan insurance and what means would be available to CMHC to mitigate those risks is being investigated.

CMHC Project Officer: Brian Ludlow

CIDN: 1891 0100001

Division: Strategic Planning, Policy and Marketing

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MORTGAGES AND HOUSING FINANCE

THE IMPACT OF INHERITANCES ON THE MORTGAGE MARKET IN CANADA.

The objective of this research is to investigate the impact of inheritances on the mortgage market in Canada.

CMHC Project Officer: David Metzak **CIDN:** 1588 100001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

INVESTIGATION INTO THE CAUSES OF RISING MORTGAGE DEBT AND ITS IMPLICATIONS ON THE MORTGAGE MARKET.

The objectives of this project are to identify what is contributing to rising residential mortgage debt; how this is impacting the ability of households to pay their mortgages and other debts; and the overall impacts, both now and into the future, on rising debt levels.

CMHC Project Officer: Orlando Manti **CIDN:** 1758 0200001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

MANAGING THE RISKS ASSOCIATED WITH A REVERSE EQUITY MORTGAGE (REM) LOAN INSURANCE PORTFOLIO.

The purpose of this project is to complete a study on the management of risks associated with an insured reverse equity mortgage (REM) portfolio.

CMHC Project Officer: Brian Davidson **CIDN:** 1728 0100002

Division: Strategic Planning, Policy & Marketing **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

PERSONS WITH DISABILITIES

ACCESSIBLE DOWNTOWN RESIDENTIAL COMMUNITIES: A CASE STUDY OF WINNIPEG, MANITOBA.

The purpose of this project is to examine housing and community design needs of persons with disabilities, including the elderly, to determine how these needs could be met in a downtown residential location as part of the revitalization of a downtown area.

CMHC Project Officer: Tom Parker

CIDN: 2017 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

NEW

Grant Recipient: Nancy Klos, Institute of Urban Studies
University of Winnipeg, 346 Portage Avenue
Winnipeg, Manitoba R3C 0C3

AVAILABILITY: Publication not yet available

ADAPTING LOW-RISE RESIDENTIAL BUILDINGS.

This document will provide valuable guidance on incorporating features which enhance accessibility of low-rise apartments for people with disabilities. It has national applicability with references to Canadian codes and standards. It is scheduled to be available in the summer of 1998.

CMHC Project Officer: Tom Parker

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

IMPROVEMENT OF THE DESIGN AND ENVIRONMENT OF HOUSING WITH SUPPORT FOR PERSONS WITH DEMENTIA

The objective of this project is to identify the difficulties associated with orientation in space that can occur in an architectural environment such as that of a nursing home, in view of generating methods of intervention.

CMHC Project Officer: Luis Rodriguez

CIDN: 1638 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Romedi Passini, Full Professor
School of Architecture, Université de Montréal
Montreal, Quebec H3C 3J7

AVAILABILITY: Publication not yet available

PERSONS WITH DISABILITIES

EVALUATION OF HOUSING INITIATIVES UNDER THE NATIONAL STRATEGY FOR THE INTEGRATION OF PERSONS WITH DISABILITIES.

This is the final report from the evaluation study of CMHC'S activities under the National Strategy for the Integration of Persons with Disabilities over the 1991 to 1995 period.

The National Strategy for the Integration of Persons with Disabilities (NSIPD) was a five year federal program announced in 1991 to enhance the participation of persons with disabilities in the social and economic main stream of Canadian society. CMHC undertook two main activities in support of the National Strategy. The $10.M Home Adaptation for Seniors Independence (HASI) pilot program was to assist seniors with diminishing abilities to continue living independently in their homes and a $3.2 M research and demonstration initiative was to develop design and construction solutions to improve the living conditions of all persons with disabilities. The HASI Program has been subsequently renewed and CMHC continues to conduct research and demonstration activities to improve the living conditions of persons with disabilities.

Key Findings and Conclusions - HASI Program

The evaluation team found that the program addressed a need. These was a very high proportion of low income seniors with disabilities who wished to remain at home. The Team also found that the program was logically designed to achieve its objectives of providing equal access to housing for persons with disabilities and that the program had the potential to reduce long term health care costs.

The HASI program was found to be well targeted to low income seniors with age related disabilities. Home modifications financed by the Program improved the comfort, safety and quality of life of clients and allowed as many as one third of them to pursue an independent life style at home rather that having to move to a care facility. Over fifty percent of clients made the minor adaptations to their homes only because of the financial assistance available under HASI, while the balance would have made the modifications anyhow. The level of assistance was generally appropriate, albeit most clients contributed their own funds to the cost of modifications and most indicated that there were additional modifications needed to their homes which they were unable to afford.

With respect to program delivery, the evaluation team found that the initial low key approach to program promotion was ineffective in generating clients for the program, although subsequent efforts to increase take up were successful. It found that clients were satisfied with most aspects of the application and approval process, although there was some evidence that the forms could have been simplified. The vast majority of clients reported no problems during the process of hiring professional renovators to do the work. The evaluation team found that the HASI Program was cost effective. The total cost of the Program was offset by the cost savings realised by society as a result of the 32 percent of clients being permitted to remain at home for a year or longer rather than having to move to a care facility.

Key Findings and Conclusions - Research and Demonstration Initiatives.

The evaluation team found that there was a need for information in the area of housing persons with disabilities and that CMHC, as the federal government housing agency, was in an excellent position to carry out this work. The evaluation team found that CMHC was successful in increasing awareness of the housing needs of persons with disabilities and that the information led some to make home modifications. It concluded that CMHC's research and information projects can be expected to have important impacts on the quality of housing in the area of housing for persons with disabilities. CMHC's publications in the area of housing persons with disabilities were relevant, of high quality and timely. But many did not know that they existed. Some felt that the information should also be available through on-line computer access and in a CD ROM format.

Prepared by Audit and Evaluation Services, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE: Aussi disponible en français sous le titre : *Évaluation des initiatives de logement dans le cadre de la Stratégie nationale pour l'intégration des personnes handicapées.*

HOUSING NEEDS OF PEOPLE WITH DISABILITIES.

The objective of this project is to provide a profile of the housing characteristics and needs of people with disabilities using data from the 1991 Census and post-censal Health and Activity Limitations Survey (HALS).

CMHC Project Officer: Jamie Angus

CIDN: 1045 0200003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NARRATIVES ON DEDICATED AND INTEGRATED HOUSING ALTERNATIVES.

The purpose of this project to conduct 3 focus groups (10 in each focus group) with consumers of mental health services residing in self-contained units in three housing settings. These housing settings have off-site support staff.

CMHC Project Officer: Luis Rodriguez

CIDN: 1452 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Katherine M. Boydell, Queen Street Mental Health Centre
1001 Queen Street West
Toronto, Ontario, M6J 1H4

AVAILABILITY: Publication not yet available

PERSONS WITH DISABILITIES

AN OUTLOOK ON MENTAL HEALTH CONSUMERS HOUSING NEEDS.

The objective of this research is to examine the supportive housing needs of the severely chronically mentally ill in the Manitoulin-Sudbury District by location and by language, culture and gender.

CMHC Project Officer: Teresa van den Boogaard

CIDN: 1852 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Geneviève Gibbons, Canadian Mental Health Association
111 Elm Street
Sudbury, Ontario, P3C 1T3

AVAILABILITY: Publication not yet available

* NEW *

PROPERTY MANAGEMENT

CURRENT CONDITIONS IN THE RESIDENTIAL PROPERTY MANAGEMENT INDUSTRY.

The objectives of this project are to produce a profile of the residential property management industry that will complement recently completed market research on the industry; identify the state-of-the-art currently available information on issues where the greatest need for information exists; and determine the nature and depth of information gaps and research needs.

CMHC Project Officer: David Scherlowski

CIDN: 1966 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

THE COMMUNITY ORIENTED MODEL OF THE LIVED ENVIRONMENT.

The objective of this project is to update and revise measures and data sources for indicators and specific measures for the Community Oriented Model of the Lived Environment (COMLE) and update the annotated bibliography of quality of life research.

CMHC Project Officer: Jamie Angus

CIDN: 1680 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

QUALITY OF LIFE INDICATORS: A PILOT TEST OF THE COMMUNITY ORIENTED MODEL OF THE LIVED ENVIRONMENT.

The purpose of this study was to conduct a pilot test of the Community Oriented Model of the Lived Environment (COMLE). COMLE provides an approach for applying 40 quality of life indicators in municipalities, and makes a direct link between quality of life and urban sustainability. The first version of COMLE was produced in 1992 and successfully tested in 1993 by three Canadian municipalities - Quebec City, Toronto and Fort McMurray. Subsequently, COMLE was used in 1995 for a major study on quality of life in the Greater Toronto Area (GTA). This report presents the results and lessons learned from the 1993 pilot test.

The report describes the parameters of the pilot test, and summarizes the experiences of the participating municipalities (their full reports are in the appendices). The primary objective of the test was to have practitioners in municipal government evaluate the model under normal working conditions. The test lasted about 13 weeks and required the equivalent of just over one month of staff time. Each city made a unique contribution.

The test confirmed that the structure of COMLE is valid and meaningful for use at the local level. The report recommends improvements to the model, discusses its limitations, and states some conditions for its successful use. Since the model is based on objective indicators, it is necessarily incomplete and should be supplemented with qualitative information. Statistical measures require interpretation to be properly understood; therefore, users should provide context and commentary in their reports. Although the model suggests a list of indicators, users are encouraged to adapt it to individual circumstances, which means considering at the outset the nature of local issues and the audience for the resulting report.

Prepared by David H. Sherwood. Prepared for the Centre for Future Studies in Housing and Living Environments, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1996.

Order number: PE0264. ** Price: $12.95 + GST and handling charges. **STATUS:** Completed Report

AVAILABLE: CMHC Information Products, 700 Montreal Road, Suite 1000, Ottawa, Ontario, K1A 0P7. Tel.: 1-800-668-2642. Fax orders from Canada: 1-800-245-9274. International clients see page 9 for order instructions.

NOTE : Aussi disponible en français sous le titre : *Indicateurs de la qualité de vie : essai pilote du Modèle d'orientation communautaire de l'environnement habité (PF0264).*

PROSPECTS FOR, AND POTENTIAL IMPACTS OF, REAL ESTATE INVESTMENT TRUSTS (REITS).

The objective of this research is to assess whether or not REITs reflect a financing mechanism which could improve the affordability and financial viability of either rejuvenating existing and/or constructing new rental housing in Canada.

MHC Project Officer: David Metzak

CIDN: 2011 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

NEW

Grant Recipient: Tony Wellman
236 Royal Avenue
Ottawa, Ontario, K2A 1T7

AVAILABILITY: Publication not yet available

CONSTRUCTION STANDARDS FOR ACCESSORY SUITES = NORMES DE CONSTRUCTION VISANT LES APPARTEMENTS ACCESSOIRES.

The major task facing many urban municipalities is not one of introducing accessory suites, but rather one of converting illegal suites into legal dwelling units. The City of Saskatoon wanted to encourage its landlords to upgrade illegal suites to acceptable standards of health and safety, while helping to make the process as straightforward and economical as possible. In this way, the City would improve the quality of existing dwellings and ensure the continuing availability of affordable housing. Several other cities in Canada have undertaken regulatory reform projects regarding secondary suites and the conversion of illegal units.

The City received an A.C.T. grant in 1993 to proceed with its project, which consisted of four phases:

- ***Phase One*** -- the project team reviewed existing regulations (zoning by-law, and building and fire codes) and literature on accessory suites.
- ***Phase Two*** -- a sample of suites was inspected in an inner-city test area to determine the type and extent of violations that actually existed.
- ***Phase Three*** -- the project team assessed the City's zoning by-law requirements for accessory suites and developed an evaluation procedure to encourage compliance.
- ***Phase Four*** -- educational materials were developed (a four-page brochure, a pamphlet and a short video) to inform landlords about compliance requirements and the upgrading process.

The inspections in the second phase revealed several items typically not up to standard. The City addressed these in its educational materials. The City also emphasized its intent to ensure compliance with National Building Code (NBC) guidelines and Saskatoon's zoning by-law, while encouraging the continued presence of accessory suites.

As a result of the project, the City of Saskatoon determined that it needed to make a clear differentiation between accessory suites and other types of apartment dwellings, since the lack of distinction had proven to be confusing. The City defined an accessory suite as a second, self-contained unit in a house originally planned as a single-family dwelling. Where three or more units existed in one structure, the City treated them as apartment units that were required to comply with zoning and building code regulations relating to multiple-unit dwellings. This distinction allowed the Planning and Building Department to formulate appropriate guidelines aimed at encouraging the availability of accessory suites as a safe, affordable housing option, while recognizing their unique presence in residential neighbourhoods.

Affordability and Choice Today (A.C.T.) Streamlined Approval Process Project / City of Saskatoon, Saskatoon, Saskatchewan. Prepared by: Energy Pathways Inc. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association and Canada Mortgage and Housing Corporation. Ottawa: The Federation: The Associations: The Corporation, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
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NOTE: Bilingual/bilingue.

"GARDEN SUITES" PILOT PROJECT: CASE STUDY = PROJET PILOTE DE PAVILLONS-JARDINS : ÉTUDE DE CAS.

In 1990, Interchurch Housing Society (ICHS), a charitable non-profit organization, received an A-C-T grant to lay the groundwork for the introduction of garden suites in Kings County, Nova Scotia. To demonstrate the different regulatory requirements for urban and rural sites, it proposed to deploy two units; one in a rural setting and the other in an urban setting. The objective was to allow the community to view this form of housing and evaluate the degree of success of the project in order to set the stage for future deployments.

Interchurch met several times with the County to identify a procedure for selecting a site and approving the proposed units. Initially, the County planned to follow a development agreement approach, but decided against doing so because of limitations in this procedure, and the possibility of obtaining provincial approvals by way of updating its planning strategy and land-use by-law. In September 1992, the Planning Strategy and Land-use By-law were submitted to the Nova Scotia Department of Municipal Affairs for approval. The Minister approved both with amendments. All provisions for garden suites were, however, deleted because there existed no authority in the *Planning Act* to control land use on the basis of ownership of a structure.

Over the course of the following two years ICHS worked with the provincial lobby group, Affordable Housing Association of Nova Scotia (AHANS), to lobby the province to give municipalities the desired authority to allow garden suites. In September 1994, the Province confirmed that it was considering draft legislation to amend local planning regulations. In December 1994, Interchurch Housing Society requested that its A-C-T project be terminated since it had no opportunity to influence the proposed legislation.

Although under current legislation there is no process in Kings County which allows a family member to house a senior family member in a garden suite it could be possible in the not too distant future. This project contributed significantly to the initiation of dialogue at the provincial level on developing changes in the *Planning Act* to give municipalities the authority to regulate suites.

Affordability and Choice Today (A.C.T.) Demonstration Project / Interchurch Housing Society, Kentville, Nova Scotia. Prepared by: Rosemary Kinnis, ACT Program Manager, Federation of Canadian Municipalities. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association and Canada Mortgage and Housing Corporation. Ottawa: The Federation: The Associations: The Corporation, 1997.

STATUS: Completed Report

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700 Montreal Road, Ottawa, Ontario, K1A 0P7
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NOTE: Bilingual/bilingue.

LEGALIZATION OF SECONDARY SUITES IN SURREY, B.C.: CASE STUDY = LA LÉGALISATION DES APPARTEMENTS ACCESSOIRES À SURREY (C.-B.) : ÉTUDE DE CAS.

In 1990, the City of Surrey, British Columbia launched a program to legalize secondary suites that met basic health and safety standards. The objectives of the program were to better manage the impacts of secondary suites on neighbourhoods and municipal services, and to accommodate new convertible housing designs for affordable home ownership.

The legalization process involved the adoption of new zones and regulations. Council, in August 1992, (after consultation with the community) divided the municipality into three types of secondary suite policy areas: areas where secondary suites were to be allowed and rezoned by Council (Area Rezoning); areas where individual units could be rezoned (Spot Rezoning); and areas where secondary suites were not permitted at all (Single-Family Only). The Spot Rezoning designation was eliminated in December 1994.

To facilitate administration, Council adopted a secondary suite policy which included the following five conditions for approval of suites:

- a secondary suite can be located in a single-family home only, not in a duplex;
- the applicant must either own or live in the main unit;
- the secondary suite cannot be larger than 90 square meters;
- one additional parking space must be provided; and,
- only one secondary suite is permitted per single-family home.

To ensure that basic health and safety standards are met, the City also developed various technical and regulatory requirements for the suites.

Despite efforts to legalize suites through the secondary suite program only a handful of properties have been legalized. In 1995, Council authorized the formation of a committee to review the program. The main concerns the committee examined were that the suite process is quite complex and lengthy; suites are not permitted in many areas; and Surrey is not collecting very much of the potential tax and licensing revenue from properties with suites. It explored these issues in depth and developed draft solutions.

A staff report containing recommendations based on the Committee's draft solutions was approved by Council in September 1996. It forms the basis for a new approach to regulating secondary suites in Surrey. This approach is aimed at accomplishing the legalization of more suites through an easier and simpler administrative process for the public, Council and staff. Changes will be made to the by-law enforcement and revenue collection procedures and this could lead to improvements in services to areas in which suites are provided.

Affordability and Choice Today (A.C.T.) Case Study Project / City of Surrey, British Columbia. Prepared by: Rosemary Kinnis and David Scherlowski. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; and Canada Mortgage and Housing Corporation. Ottawa: The Federation: The Associations: The Corporation, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
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NOTE: Bilingual/bilingue.

MEDIATION AS A TOOL TO RESOLVE LAND-USE DISPUTES: HOW KAMLOOPS INTEGRATED MEDIATION INTO ITS LAND DEVELOPMENT APPROVAL PROCESS: CASE STUDY = LA MÉDIATION : UN OUTIL DE RÉSOLUTION DES CONFLITS SUR LES UTILISATIONS DES SOLS : COMMENT KAMLOOPS A INTÉGRÉ LA MÉDIATION DANS SON PROCESSUS D'APPROBATION DES PROJETS D'AMÉNAGEMENT FONCIER : ÉTUDE DE CAS.

The traditional tool used to resolve land development disputes is the public hearing process. Adversarial in nature, it often produces a win-lose outcome that may only deepen the bitterness and divisions in a community. Recognizing these shortcomings, cities across the country are designing new strategies that aim to increase public participation in community growth decisions without strangling needed development. Many of these approaches, however, carry price tags that make them inappropriate for councils under pressure to hold the line on taxes. Kamloops Council was in this situation so it decided to provide the option of mediation at the rezoning stage as a cost-effective way to enhance public involvement in land development proposals.

The City first tried using its own planners in the role of mediators. While this proved to be an inappropriate role for city planners, their efforts did prove that mediation could work. Thus encouraged, the City authorized an Alternative Dispute Resolution (ADR) Task Force to help the city design a mediation process that would be part of the City's development approval process. The City was awarded an A.C.T. grant to help defray the costs of developing and implementing the mediation process.

The process, approved by Council in February 1996, set up a Mediation Services Group composed of residents from the community who would mediate land-use disputes on a volunteer basis. The mediators were screened to ensure they did not belong to any groups related to the development industry or to anti-development organizations. They attended workshops where they were taught land development issues and procedures and the theory and techniques of alternative dispute resolution. Now a developer, foreseeing public resistance to a proposal, can ask the City to approve mediation to resolve the potential dispute before the proposal goes to a public hearing. Developers applying for the service pay a nominal fee of $350 - kept deliberately low to encourage its use.

The initiative resulted in regulatory reform as the City had to amend its land development approval by-laws to formally include the mediation option. Other municipalities can also benefit from the Kamloops initiative, which provides a model they can follow to include mediation in their own operations.

Affordability and Choice Today (A.C.T.) Streamlined Approval Process Project / Development Services Department, City of Kamloops, British Columbia. Prepared by: Word-Works Communications Services. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; and Canada Mortgage and Housing Corporation. Ottawa: The Federation: The Associations: The Corporation, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
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NOTE: Bilingual/bilingue.

PLANNING COHOUSING = LA PLANIFICATION DES ENSEMBLES D'HABITATION COMMUNAUTAIRES.

Creative Communities, a multi-unit housing builder/developer, and the Collaborative Housing Society received an A.C.T. grant in 1993 to research and produce a handbook on planning and zoning issues that affect cohousing projects.

The project team worked with cohousing groups and municipalities in the Greater Toronto Area to develop the handbook, which was intended to serve two main purposes:

- To assist groups in understanding the development approval process;
- To help municipal planners understand the concept of cohousing and appreciate the intentions of cohousing groups.

Research conducted for the project involved the following components:

- A survey of the specific development needs and interests of cohousing groups and their experience with, and perception of, the planning process;
- A survey of the regulatory environment, involving interviews with representatives from four municipal planning departments;
- A one-day charrette involving cohousing groups and municipal planners.

The research showed that cohousing groups and planners can benefit by working together. Municipal planners can help groups understand the planning process, and groups can help planners understand the benefits inherent in cohousing development. In some cases where regulatory barriers were encountered, cohousing groups have worked with planners to arrive at mutually beneficial solutions.

External collaboration with planners and neighbours emerged as being as significant to the success of a cohousing development as internal collaboration within a cohousing group itself. The project team found that a lack of such collaboration early in the process could pose a real barrier to cohousing development, and that open dialogue was a critical factor. Representatives from each of the four municipal planning departments involved in the project were interested in supporting the cohousing option, especially as they learned more about individual cohousing projects and understood them.

Affordability and Choice Today (A.C.T.) Streamlined Approval Process Project / Creative Communities and the Collaborative Housing Society, Toronto, Ontario. Prepared by: Energy Pathways Inc. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: The Federation: The Associations: CMHC, 1997.

STATUS: Completed Report

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NOTE: Bilingual/bilingue.

SMALL-LOT SINGLE FAMILY INFILL HOUSING: CASE STUDY = CONSTRUCTION DE MAISONS INDIVIDUELLES INTERCALAIRES SUR DE PETITS TERRAINS : ÉTUDE DE CAS.

In November 1990, the City of Victoria received an A.C.T. grant to demonstrate that integrating new housing into established neighbourhoods (infill development) can, under appropriate design guidelines, improve the quality, choice and affordability of housing. The City of Victoria proposed to undertake its A.C.T. project in two phases. In the first phase it would examine community concerns and reflect them in developing clear design guidelines that must be considered when designing infill housing, and in developing a zoning by-law which would regulate some aspects of the houses such as size, proximity to street and parking requirements. In the second phase, the approaches developed in phase one would be tested and demonstrated by building three houses.

The project was launched by first establishing a project team comprising all the key stakeholders: community groups, representatives from the building industry, and City staff and Council. Small lot design guidelines applied in other cities were examined and analyzed to determine their appropriateness for Victoria. The team brought the results of this research to the residents and the development community to obtain their input. With the results of the research and community input, the City proceeded to draft the new design guidelines and zoning by-law.

Construction of the three units was completed in March 1995. Soon after, the City officially launched the demonstration with an opening ceremony and the houses remained open for two weeks to allow for public viewing. An important component of the project was measuring community acceptance. Results indicate that the vast majority of the respondents thought that the project suited the neighbourhood and was a positive development.

All three units have been sold with prices around $204,000, comparing favourably with new single family homes in this location which normally sell for approximately $280,000.

Affordability and Choice Today (A.C.T.) Demonstration Project / City of Victoria. Prepared by: Rosemary Kinnis, Act Program Manager, Federation of Canadian Municipalities. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association and Canada Mortgage and Housing Corporation. Ottawa: The Federation: The Associations: The Corporation, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE: Bilingual/bilingue.

RENOVATION

ANALYSIS OF RENTAL REPAIR AND RENOVATION EXPENDITURE SURVEY - 1995.

The purpose of this project is to conduct the analysis of the "Rental Repair and Renovation Expenditure Survey - 1995".

CMHC Project Officer: Roger Lewis **CIDN:** 1888 0200001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

HOMEOWNER MOTIVATION AND INNER CITY REVITALIZATION: AN EXAMINATION OF RELATED FACTORS IN WINNIPEG.

The objective of this research is to identify the revitalization process underway (e.g.) incumbent upgrading or gentrification in inner city areas demonstrating a high level of renovation activity.

CMHC Project Officer: Glynis Kossatz **CIDN:** 1277 0200001

Division: Research Division, External Research Program **STATUS:** Ongoing Project

Grant Recipient: Tom Carter, University of Winnipeg, Dept. of Geography
Winnipeg, Manitoba, R3B 2E9

RENTAL HOUSING

THE PRIVATE RENTAL HOUSING SECTOR AND ITS NEW CLIENT GROUP

A review of the literature (including research on the Internet) will be aimed at identifying approaches and programs targeting harmonious relations between landlords and their new client group.

CMHC Project Officer: Benoit Sanscartier **CIDN:** 1648 0200001

Division: Research Division, External Research Program **STATUS:** Ongoing Project

Grant Recipient: Luba Serge
29 Easton Street
Montreal, Quebec H4X 1K9

AVAILABILITY: Publication not yet available

RENTERS AND THEIR HOUSING CONDITIONS: FROM THE 1980s INTO THE 1990s.

The purpose of this project is to examine how and why the circumstance of renter households changed over the last fifteen years, with special focus on housing conditions, and the social and economic factors associated with changes in the level and nature of housing need.

CMHC Project Officer: John Engeland

CIDN: 1582 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RESIDUALIZATION OF RENTAL TENURE: ATTITUDES OF PRIVATE LANDLORDS TOWARD HOUSING LOW INCOME HOUSEHOLDS.

The objective of this research study was to determine whether or not a gradual process of change in the profile of tenants in the private rental sector is occurring. It was hypothesized that this trend, here labeled "residualization", is evolving and that it may have important consequences for government policy.

The research has employed three approaches to this exploration: a literature analysis; a statistical analysis of existing data on household characteristics; and a qualitative survey of two subgroups of rental investors-- recent vendors and purchasers.

The study concludes by outlining the imperative for some policy attention on the rental market. In particular, it is noted that there is not a level playing field in terms of support for ownership and rental tenure. There has long been a preoccupation with increasing access to homeownership. To the extent that the rental market and homeownership sector are closely related, initiatives to enhance access to ownership contribute to weakening demand in the rental sector and are a factor in the trend to residualization. The residualizing trend has been identified as a factor impacting the attractiveness of investment in the rental sector.

The need for a mixed policy approach is identified. This could include various types of demand side programs, such as shelter allowances and rent supplements, but should also be balanced with initiatives to assist the non-profit sector to acquire existing properties in which the private sector appears to be disinterested. The study found that a large number of properties are put up for sale each year and these are often available at a price that would approach an affordable level for lower income households. Currently however, non-profit organizations do not have the capital to pursue such opportunities.

The study identifies an important distinction between discrimination and prudent management. It is argued that landlords are not necessarily adverse to specific household types, they simply associate risk of default and bad debt with certain characteristics. An appropriate policy response would be to focus on mitigating risk. This could be pursued through some form of insurance program that protects investors against these risks. An insurance program does not entirely mitigate risk, nor would it necessarily eliminate selectivity. However, it would formalize an objective system of risk analysis and could help to reduce the barriers that currently confront many lower income households purely on the basis of stereotyping.

Prepared by Steve Pomeroy, Focus Consulting Inc. CMHC Project Officer: Benoît Sanscartier. Ottawa: Canada Mortgage and Housing Corporation, 1998 (External Research Program)

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE: Bilingual/bilingue.

REVIEW OF METHODS GOVERNMENTS HAVE EMPLOYED TO SUPPORT PRIVATE RENTAL HOUSING.

The objective of this project is to develop a thorough understanding of the programs and policies employed by governments both domestically and internationally to support private rental housing.

CMHC Project Officer: David Metzak

CIDN: 1885 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

UNDERSTANDING PRIVATE RENTAL HOUSING INVESTMENT IN CANADA.

The project will investigate rental housing investment in Canada and establish a basis from which public and private decision makers can clearly understand the environment for investment in, and development of, rental housing.

CMHC Project Officer: Tim Elliot

CIDN: 1748 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ALTERNATIVE PLANNING AND REGULATORY APPROACHES USED IN OTHER COUNTRIES.

This project investigates and documents international experiences that may offer potentially useful lessons and insights on the application of performance-based planning and regulatory approaches and systems, and the use of financial and economic incentives to improve the flexibility and effectiveness of the development environment.

CMHC Project Officer: Jamie Angus

CIDN: 1775 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CRITICAL SUCCESS FACTORS ENABLING ALTERNATIVE RESIDENTIAL DEVELOPMENT STANDARDS.

This research is to determine where there are certain instruments, strategies or conditions that enhance the prospects of changing or relaxing rules and regulations with respect to residential development. The grant recipient will discuss with seasoned individuals how they might approach the regional land use issues now under much scrutiny.

CMHC Project Officer: David D'Amour

CIDN: 2006 020001

Division: Research Division, External Research Program

STATUS: Ongoing Project

NEW

Grant Recipient: Teresa Paul
10937-79th Avenue
Edmonton, Alberta, T6G 0P1

AVAILABILITY: Publication not yet available

INCREASING URBAN DENSITIES TO ACCOMMODATE POPULATION GROWTH.

This project examines the issue of urban density in order to deal with population growth pressures, taking into account public policy and regulations, private development decisions, and urban form, with a view toward projecting the implications of growth in terms of built form, land consumption, infrastructure, and the distribution of housing.

CMHC Project Officer: Fanis Grammenos

CIDN: 1844 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Gerald Daly, Daly & Associates
Box 139, RR #4
Flesherton, Ontario, N0C 1E0

AVAILABILITY: Publication not yet available

THE INFORMATION REVOLUTION AND RESIDENTIAL DEVELOPMENT.

The objective of this research is to examine residential development within the context of the information revolution.

CMHC Project Officer: Benoit Sanscartier

CIDN: 2014 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

NEW

Grant Recipient: Pamela Blais
182 Crawford Street
Toronto, Ontario M6J 2V6

AVAILABILITY: Publication not yet available

RESIDENTIAL INTENSIFICATION IN CENTRAL DISTRICTS

The objective of this research is to examine the phenomenon of residential intensification in a dense urban sector using data on the new housing built there in the last five years and on the new residents who live there, in view of drawing lessons for the renewal of central districts in large Canadian cities.

CMHC Project Officer: Mark Holzman

CIDN: 2012 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

NEW

Grant Recipient: Jocelyn Duff, Habitat sur mesure
4626 Bordeaux Street
Montreal, Quebec, H2H 2A1

AVAILABILITY: Publication not yet available

RESIDENTIAL STREET DESIGN: LEARNING FROM SUBURBIA.

The purpose of this research project is to generate concrete residential street design solutions based upon a thorough understanding of precedents, and introduce and stimulate new ideas for land developers and design professionals.

CMHC Project Officer: Fanis Grammenos

CIDN: 1644 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Sevag Pogharian , Sevag Pogharian Design
4643 Sherbrooke Street West, Suite 12
Montreal, Quebec, H3Z 1G2

AVAILABILITY: Publication not yet available

ROOFTOP GARDENS

ROOFTOP AND VERTICAL GARDENS: IDENTIFYING OPPORTUNITIES AND BARRIERS TO WIDESPREAD USE.

The purpose of this project is to develop a Canadian "status report" on rooftop and vertical gardens.

CMHC Project Officer: Susan Fisher

CIDN: 2005 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

NEW

Grant Recipient: Steven Peck
35-859 Millwood Road
Toronto, Ontario, M4G 1W7

AVAILABILITY: Publication not yet available

SENIORS

ASSESSMENT OF PHASE I OF THE BENNY FARM RE-DEVELOPMENT PROJECT.

This research will determine the effectiveness of the approach taken by CMHC to relocate the residents of the Benny Farm Project and find out how well the new housing meets the residents' current and future needs and preferences for accommodations.

CMHC Project Officer: Luis Rodriguez

CIDN: 1751 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOME ENVIRONMENTS AND FALLS BY SENIORS

The purpose of this project is to determine the significance of environmental factors that are likely to cause falls among independent and active seniors living in their own homes within the territory of the Québec Urban Community.

CMHC Project Officer: Luis Rodriguez

CIDN: 1843 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Benoît Lévesque
Centre de santé publique de Québec
2050 René-Lévesque Blvd.
Sainte-Foy, Quebec G1V 2K8

AVAILABILITY: Publication not yet available

INTERVENTION MODELS: SAFETY IN CASES OF EMERGENCY OF PERSONS WITH REDUCED MOBILITY AND SENIORS LOSING THEIR INDEPENDENCE LIVING IN REGULAR RESIDENTIAL ENVIRONMENTS

This study is aimed at integrating current knowledge and reflections concerning the problems associated with the safety of seniors and persons with disabilities living in regular residential environments, in order to apply them to the development of intervention models for three multiple-family buildings equipped with elevators.

CMHC Project Officer: Luis Rodriguez **CIDN:** 460 0200001

Division: Research Division, External Research Program **STATUS:** Ongoing Project

Grant Recipient: Sylvie Quintin, Société d'habitations communautaires logique inc.
3250 St-Joseph Blvd. East
Montreal, Quebec H1Y 3G2

AVAILABILITY: Publication not yet available

LIVING AT HOME OR IN A RESIDENCE: A CHALLENGE FOR SENIORS AND WORKERS

The objective of this project is to examine, in Quebec's Saguenay area, the circumstances, constraints, limitations and difficulties encountered by clients who receive home care and the organizations that provide it.

CMHC Project Officer: Luis Rodriguez **CIDN:** 1641 0200001

Division: Research Division, External Research Program **STATUS:** Ongoing Project

Grant Recipient: Danielle Maltais, Université du Québec à Chicoutimi
555 de l'Université Blvd.
Chicoutimi, Quebec G7H 2B1

AVAILABILITY: Publication not yet available

MAINTAINING SENIORS INDEPENDENCE IN RURAL AREAS: A GUIDE TO PLANNING FOR HOUSING AND SUPPORT SERVICES.

The purpose of this project is to produce the final manuscript of a revised version of CMHC's current publication "Maintaining Seniors Independence in Rural Areas: A Guide to Planning for Housing and Support Services" (NHA 6298).

CMHC Project Officer: Luis Rodriguez **CIDN:** 1780 0200001

Division: Research Division **STATUS:** Ongoing Project

AVAILABILITY: Publication not yet available

NEIGHBOURHOOD GROUP HOMES FOR THE ELDERLY: THE PLANNING, DESIGN AND DEVELOPMENT PROCESS.

This study focuses on sheltered housing projects, to the extent that they are limited to small numbers of units. The goal of this project was to produce a guidebook appropriate to the Canadian context which analyses and documents the planning, financing, site selection, design, development, start-up and marketing process of a sample of Canadian Abbeyfield Houses, and other small-group housing for the elderly. Case histories were collected with respect to the context and circumstances of their development, the key players in this process and their roles. Comparison and critical analysis of these projects' development experience provides insight into the process of implementing this residential option. The specific problems experienced and their respective solutions are highlighted. The potential contribution of this report to the housing industry is in *facilitating easier and faster development* of supportive group homes in existing neighbourhoods.

The report begins with a general introductory chapter, including background, context and definition of the housing model. This is followed by a brief review of the literature on the topic, highlights of the policy relevance of this research, and a summary of the aims of the study. A brief outline of the methodology is included next, with a full discussion in Appendix B. The main body of the report constitutes presentation of findings organized by key analytical variables, including tables comparing the 22 case studies. These variables are divided between those important before and during development, and those afterward. The three final chapters include a discussion of advantages and obstacles encountered by the project sponsors, a typology of projects highlighting patterns and anomalies, and finally, conclusions and recommendations. This is followed immediately by a list of references and an annotated bibliography, organized by major topic headings, which provides a rich source of information for those wishing to do further research. Project profile sheets, with key facts and illustrations, can be found in Appendix A; Appendix C contains a detailed discussion of case study project selection criteria.

Prepared by Mary Ann Clarke Scott. CMHC Project Officer: Luis Rodriguez. Ottawa: Canada Mortgage and Housing Corporation, 1997. (External Research Program)

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

PREDICTING THE ADJUSTMENT OF ELDERLY PERSONS TO CONGREGATE CARE HOUSING.

The purpose of this project is to undertake research to complement the conventional post-occupancy studies which tend to emphasize assessing the housing environment rather than the well-being of individual occupants.

CMHC Project Officer: Glynis Kossatz **CIDN:** 1827 0200001

Division: Research Division, External Research Program **STATUS:** Ongoing Project

Grant Recipient: Dr. Robert Gifford, Optimal Environment Inc.
2311 Edgelow Street
Victoria, British Columbia, V8N 1R6

AVAILABILITY: Publication not yet available

THE PRIVATE RENTAL MARKET: ADAPTING TO THE NEEDS OF AGING TENANTS.

This research will identify the extent to which landlords in the private rental market across Canada are accommodating the needs of aging tenants, and describe and develop measures that would help landlords deal more effectively with tenant needs.

CMHC Project Officer: Luis Rodriguez **CIDN:** 1996 0200001

Division: Research Division, External Research Program **STATUS:** Ongoing Project

NEW

Grant Recipient: Kathleen Mancer, DKM Housing Consultants
141-6200 McKay Avenue
Burnaby, British Columbia, V5H 4M9

AVAILABILITY: Publication not yet available

PRIVATE RETIREMENT HOME RESOURCES IN QUEBEC

The objective of this project is to evaluate the safety and functionality of non-institutional private retirement home designs in Quebec with regard to frail senior clients who could present cognitive deficiencies.

CMHC Project Officer: Jean-François Dion, Québec Branch Office **CIDN:** 1846 0200001

Division: Research Division, External Research Program **STATUS:** Ongoing Project

Grant Recipient: Daniel Pelletier
Université Laval, Pavillon Charles-de-Koninck, Cité universitaire
Sainte-Foy, Quebec G1K 7P4

AVAILABILITY: Publication not yet available

SENIORS

USER SATISFACTION STUDY OF HOUSING OPTIONS FOR OLDER CANADIANS.

The objective of this research is to carry out user satisfaction studies of some of the newer housing options that are currently available to older Canadians, and to produce an objective and detailed report based on the results of the research.

CMHC Project Officer: Luis Rodriguez

CIDN: 1583 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SOCIAL HOUSING

THE DEVELOPMENT OF A PROFILE OF MARKET RENTERS IN SOCIAL HOUSING.

The study is a comparative analysis of market renters in social housing (municipal non-profit and private non-profit) versus those in private rental housing to determine the extent to which there are differences in the characteristics and preferences between the two groups, and to develop a profile of market renters in social housing.

CMHC Project Officer: Patricia Streich

CIDN: 1836 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Lorraine Copas, Community Focus Consulting
700-106 Goodwood Park Court
Toronto, Ontario, M4C 2H1

AVAILABILITY: Publication not yet available

MICRO ENTERPRISE AND HOME BUSINESS AS A TRANSITIONAL PLANNING CATALYST IN SOCIAL HOUSING.

The purpose of this research is to identify and analyze the key elements of the development of a program framework to permit micro enterprises and home businesses in social housing settings.

CMHC Project Officer: Phil Deacon

CIDN: 1838 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: David Bruce, Senior Research Associate, Mount Allison University
Rural and Small Town Programme
Sackville, New Brunswick, E0A 3C0

AVAILABILITY: Publication not yet available

SOCIAL HOUSING

NATIONAL ENABLEMENT DEMONSTRATION INITIATIVE.

The objective of this project is to undertake the development and coordination of a national enablement demonstration initiative to teach social housing groups the skills and techniques to use in order to develop self-help housing strategies.

CMHC Project Officer: Jamie Burr

CIDN: 1436 1500001

Division: Assisted Housing

STATUS: Ongoing Project

Grant Recipient: Canadian Housing and Renewal Association
251 Laurier Avenue West, Suite 401
Ottawa, Ontario, K1P 5J6

URBAN TRANSPORTATION

THE IMPACT OF URBAN FORM AND TRAVEL ACCESSIBILITY UPON PRIVATE VEHICLE TRAVEL.

The purpose of this study is to measure the influence of land use patterns and urban form on household travel demand and behaviour.

CMHC Project Officer: Susan Fisher

CIDN: 1752 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

URBAN TRANSPORTATION

PLANNING AND MANAGING TRAFFIC NOISE ON URBAN ROADS: INTERNATIONAL AND CANADIAN EXPERIENCE

Traffic noise on major roads in urban areas is viewed as an environmental issue with serious quality of life impacts in Europe, Australia and elsewhere. The paucity of current Canadian literature on the subject would suggest that Canada has little experience with this issue. This research identifies and describes fifteen planning and management approaches used in other countries to minimize the effects of traffic noise on residents living near arterial streets. These range from public education campaigns to low noise road surfaces, and are categorized by type of measure. Canadians should be aware of the existence of these options for addressing urban traffic noise issues. A brief survey of Canadian municipal and provincial officials reveals a general concern with traffic noise, and a range of arterial road traffic noise policies and practises, from none at all to quite comprehensive. Recommendations for further research are offered focusing on basic data gathering, current federal road and rail noise guidelines, and information dissemination.

Prepared by Margaret Eberle. CMHC Project Officer: Paula Archer. Ottawa: Canada Mortgage and Housing Corporation, 1997. (External Research Program)

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

WOMEN & HOUSING

INVESTIGATION OF ISSUES FOR THE EVALUATION OF THE NEXT STEP PROGRAM.

The purpose of this project is to conduct a literature review on second-stage housing for the Next Step Program.

CMHC Project Officer: Patricia Streich

CIDN: 1507 0500001

Division: Audit and Program Evaluation Services

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

WOMEN & HOUSING

STATE OF WOMEN AND THEIR HOUSING: 1997.

The objective of this project is to undertake and complete the study on the "State of Women and Their Housing: 1997", which develops a profile of women and their health and well-being from a housing perspective.

CMHC Project Officer: Brenda Baxter

CIDN: 1615 0100001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

YOUTH & HOUSING

HOUSING CANADA'S YOUTH.

The objective of this project is to develop social, economic, and demographic profiles of youth with an in-depth review of their current and past housing conditions, and identification and assessment of housing issues and trends into the future.

CMHC Project Officer: Ed Nera

CIDN: 1786 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

"OUT FROM THE SHADOW" - INTERNATIONAL SUMMIT OF SEXUALLY EXPLOITED YOUTH.

The purpose of this project is to gain knowledge regarding the housing-related options which can help address the key factors contributing to commercially, sexually exploited youth and the main obstacles to alleviating such circumstances.

CMHC Project Officer: Teresa van den Boogaard

CIDN: 1921 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

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Condominiums / Copropriétés (Rev. 12 p., March/mars 1986)

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(9 p., October/octobre 1988)

Home ownership / La propriété d'un logement
(Rev. 28 p., August/août 1987)

*Homelessness / Sans-logis
(Rev. 61 p., June/juin 1998)

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The Community/Privacy Trade-Off in Supportive Housing: A Qualitative Study of Consumer Preferences

Development & Testing of Floor Drain with a Valve to Block Sewer Gas for Residential Applications

Energy Performance Contracting and the Residential Sector

Estimating the Concentrations of Soil Gas Pollutants in Housing: A Step-By-Step Method

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Overheating as a Factor in House Design

Passive Monitoring of VOC in Air Using ACC

A Place to Go: An Evaluation of the Next Step Program for Second-Stage Housing in Canada

Planning Study of Native Northern Communities

Portable Pneumatic Lift Seat

The Potential for Water Efficiency Improvements in Multi-family Residential Buildings in Canada

Radon: A Guide for Canadian Homeowners

Second Dwelling Units in Rural and Village Settings

Seniors Helping Seniors with Rural Housing: Final Report

Serviceability of Floor Systems with Wood-I-Joists and Concrete Topping

Study of Home Adaptations Carried Out Under the RRAP-D and HASI Programs: Final Report

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